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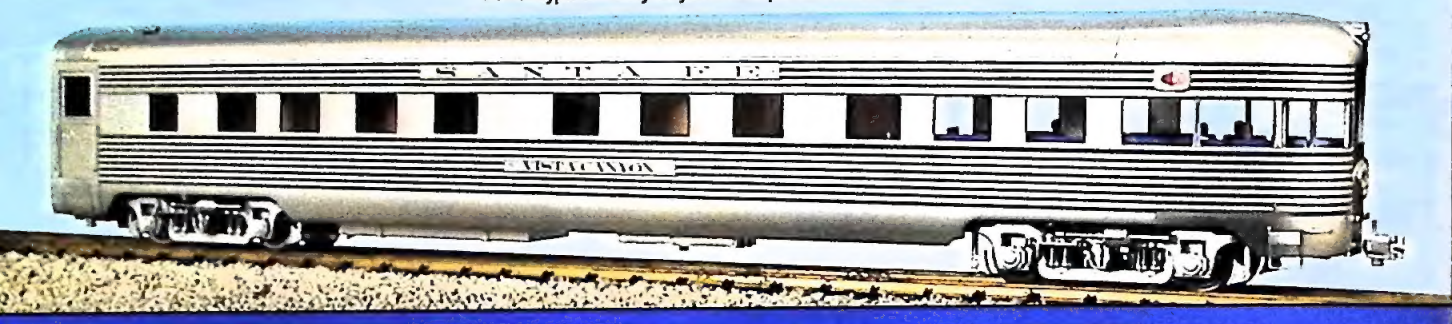

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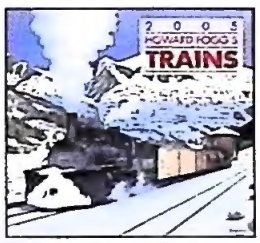

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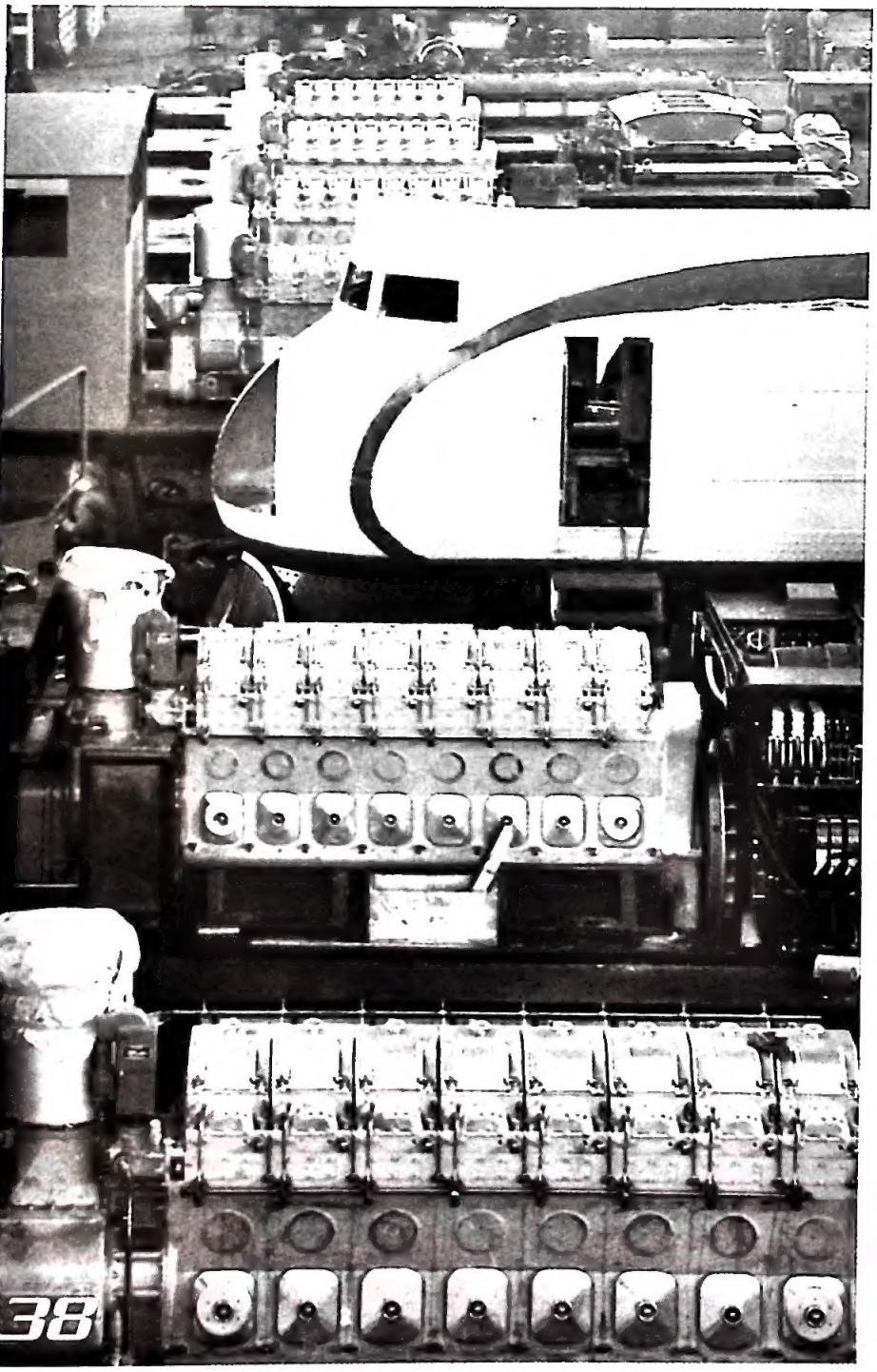
Streamliner PIONEERS

ClassicTrains

The Bold New Trains of the 1930's

CLASSIC TRAINS SPECIAL EDITION NO. 3 • 2005



On the cover: Santa Fe's *Super Chief* of 1937 offered a unique mix of speed, style, and luxury, but it was just one of a host of streamliners that introduced a new era to rail travel. *Hagley Museum & Library collection; color added by Tom Danneman*

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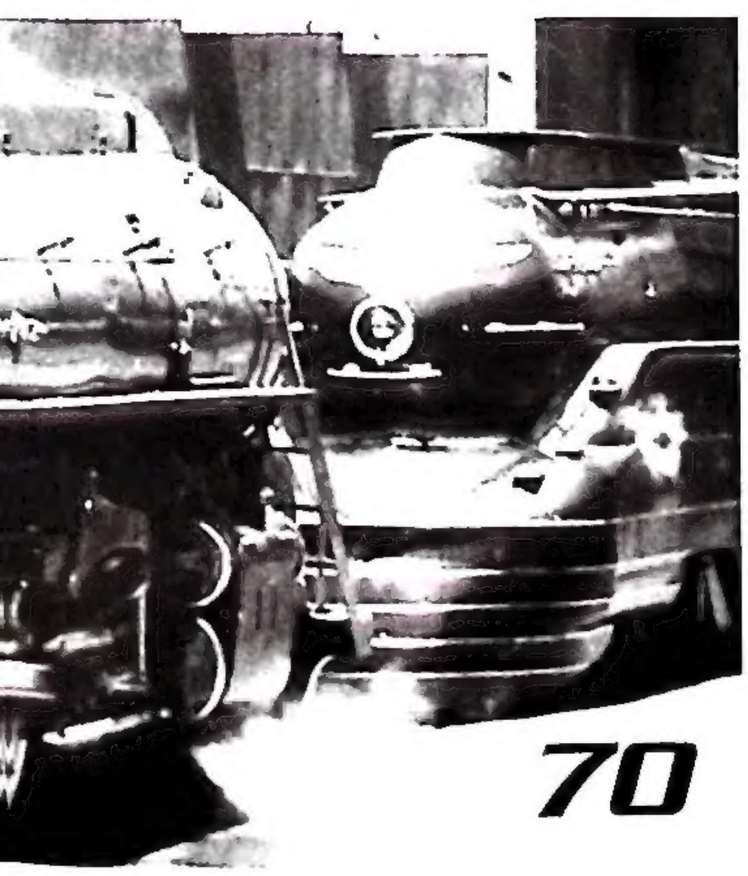

Railroading's leap into *the Land of Oz*

WITH A FEW NOTABLE EXCEPTIONS, the passenger trains of the early 1930's were pretty drab affairs, usually consisting of black steam locomotives and dark green cars. Products of a century-long evolutionary process, they were heavy, tradition-bound conveyances that, while sturdy and dependable, were hardly colorful, nimble, or exciting.

Then suddenly, as in the scene from the MGM movie *The Wizard of Oz* when Dorothy enters the Land of Oz and the film switches from black-and-white to color, railroading discovered the rainbow—and streamlining. First came Union Pacific's yellow M-10000, then Burlington's silver *Zephyr*, and then a profusion of colorful trains whose revolutionary features were more than just skin deep.

From diesel power to lightweight construction to faster schedules to a fresh emphasis on passenger comfort, the new trains embodied a host of improvements over their predecessors. They were an immediate hit, boosting ridership and revenues at a time when the railroads were being pummeled by the one-two punch of increasing highway competition and the Depression. Even people who seldom if ever rode trains caught the fever by flocking to the tracks just to see the bright new creations whiz past.

MORT WALTON

On the Burlington Route, as elsewhere, streamliners put a new face on railroading.

In a sense, though, the streamline era that began in 1934 was just as much an illusion as the Land of Oz itself. World War II halted the introduction of new trains, and despite massive postwar investment in passenger service, the railroads never did recapture the magic of the prewar period.

Yet those wonderful eight years—the ones that gave us the *Super Chief*, *Hiawathas*, *Daylights*, *Rockets*, E units, GG1's, Dreyfuss Hudsons, and so many other classics—will always stand as one of the most innovative, exciting, and creative times in railroad history.

Robert S. McGonigal

Streamliner PIONEERS

CLASSIC TRAINS SPECIAL EDITION NO. 3 • 2005

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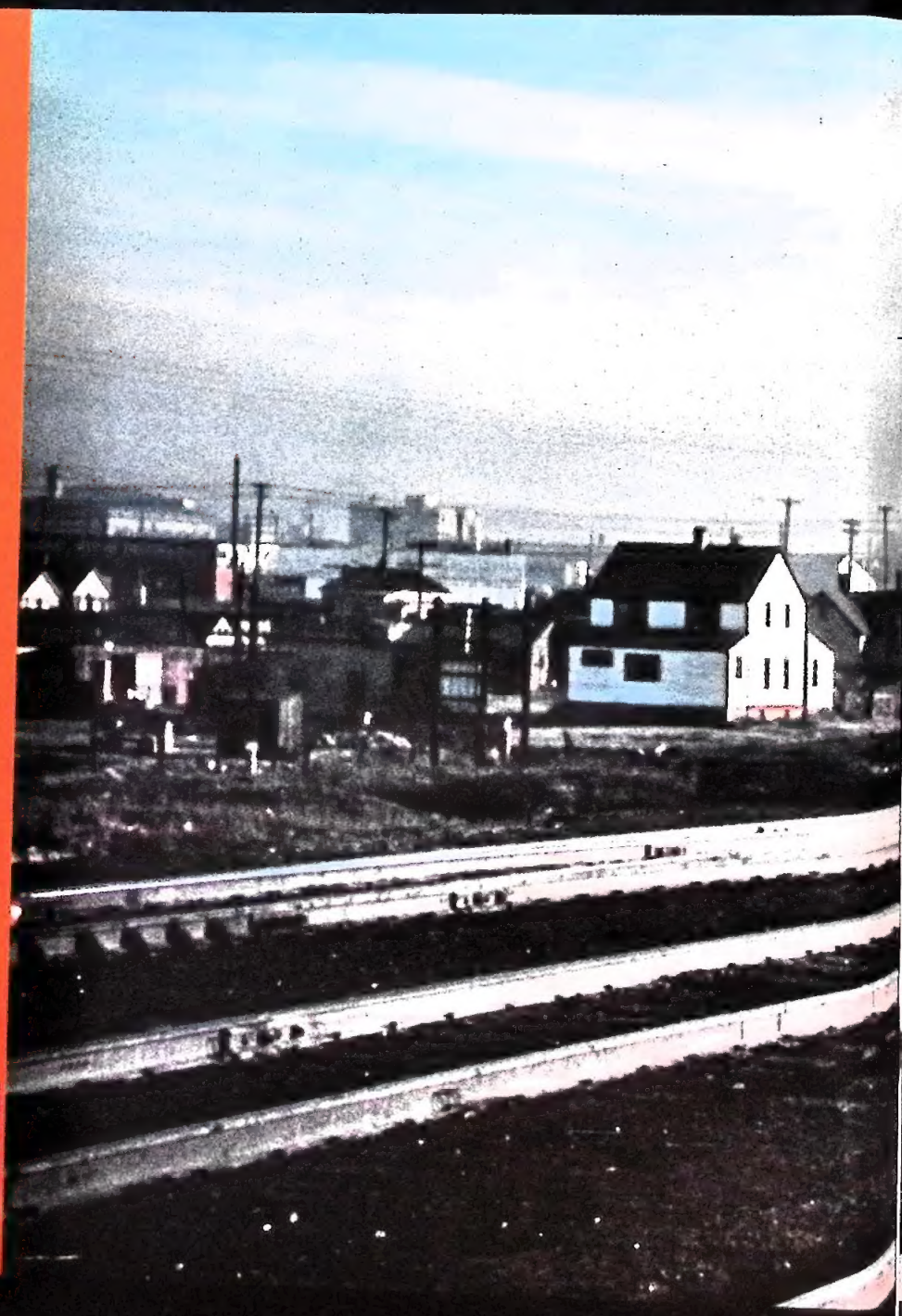
New deal for

BY **JOE WELSH**

DAWN IS NEAR on a pleasant June day in 1935, six years into the Great Depression. You have paused at a rural grade crossing in central Nebraska, where you have come many times before to watch Union Pacific's high-wheeled steam locomotives roar by with cross-country passenger trains. Your dust-covered Chevy Roadster chugs patiently, when suddenly, off to the east, you see something unusual—a boiling cloud of dust centered around a fast-approaching headlight. In a flash, a blur of a train like nothing you have seen before screams by you like a meteor. Lacking the familiar, smoking steam locomotive up front, this creature is clad in bright yellow. It is the new *City of Portland* train, flashing by in a headlong rush for its namesake . . . and destiny.

You have just encountered your first streamliner. All across the nation, thousands of Americans are getting a



Gleaming in the sun of a new day, UP diesel streamliner M-10002, working the westbound *City of Portland*, leaves smoky, steam-era Cheyenne, Wyo., behind on November 11, 1939.

RICHARD H. KINDIG

In the midst of the Great Depression, a blend of technology, artistry, and

rail travel

marketing savvy meant happy days for railroads and their passengers

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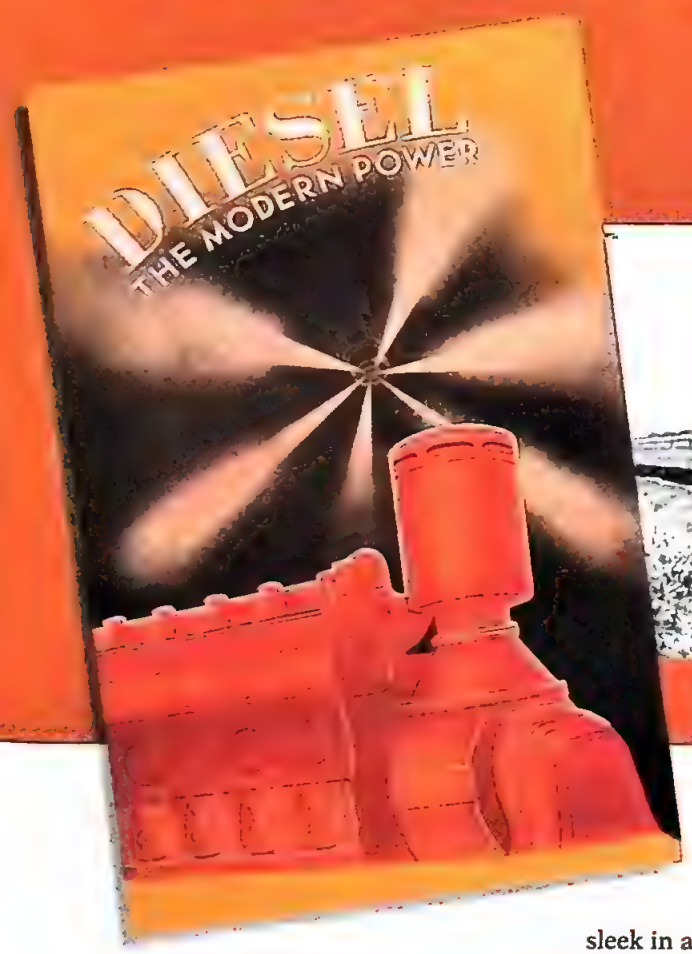
10 INNOVATIONS of the early streamliner era

1. Diesel-electric power

Perhaps more than any other technical innovation, diesel-electric power made the streamliner a success. The new trains may have been sleek and light in weight, but it was primarily the diesel up front that made them fast and economical to operate. And for the most part, the new diesels were as attractive as the trains they pulled. While the early diesel streamliners had power cars that shared a truck with the rest of the train they pulled, by 1935 the first independent, non-articulated passenger diesels were on the scene. These box-cabs hauled the likes of B&O's *Royal Blue* and Santa Fe's original *Super Chief*. The passenger diesel quickly evolved into something more powerful, reliable, and attractive. And when Electro-Motive unveiled its gorgeous E-series locomotives in 1937, it was clear that the passenger diesel was here to stay. Many streamlined trains benefited from diesel power, too, on the Louisville & Nashville and other roads.

Not all railroads initially chose diesels to haul their new streamliners. For example, two giants, New York Central and Pennsylvania, avoided passenger diesels entirely until after World War II. By then there was ample evidence of the diesel's efficiency and reliability, and both quickly abandoned steam. By the mid-1950's, diesel-electrics hauled the vast majority of passenger trains, and steam had been relegated to less important tasks or sidelined altogether.



LEFT: GENERAL MOTORS; ABOVE: LOUISVILLE & NASH...

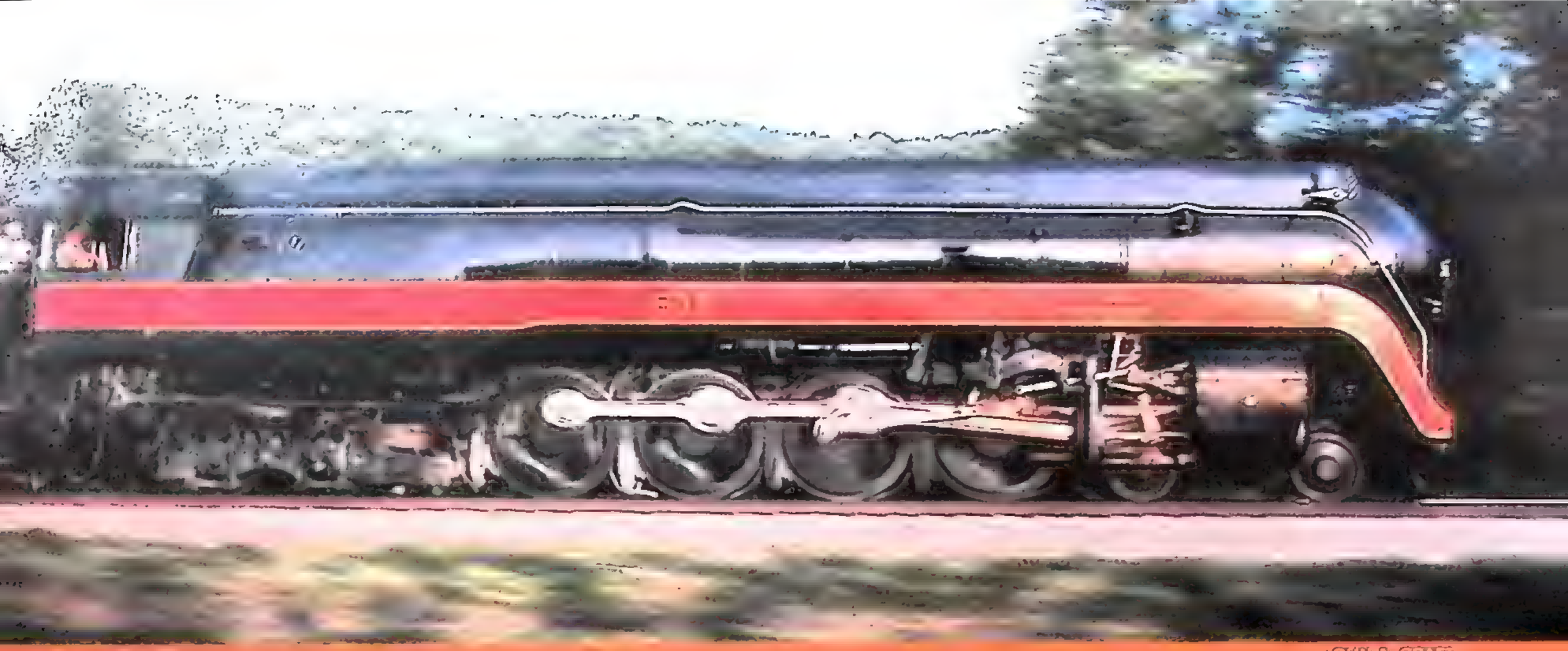
similar introduction to a new era—a new deal, to borrow a term of the time—in rail travel.

American railroads, desperate to recover passengers and dollars lost to the automobile and the Depression, had taken bold steps to revitalize their image. UP's *City of Portland*, introduced on June 6, 1935, embodied many of those changes. The train, built by Pullman-Standard, was hauled by diesel locomotives nearly twice as efficient as a steam engine, yet cleaner, quieter, and smoother. The train was constructed largely of aluminum, making it much lighter in weight than a conventional train. It was sleek in appearance, and designed with thoroughly modern interiors.

Moreover, it was as fast as all get-out. On the Chicago-Portland run (Chicago & North Western handled it east of Omaha), the new train operated on a 39¾-hour schedule, shaving an amazing full day off the previous steam-and-standard-car timing.

This not-so-quiet transportation revolution began in 1934. Spurred by a 37 percent drop in national passenger revenues from 1929 to 1931, the railroad industry unleashed the streamliner as the prime weapon in its arsenal against a fearsome foe—mediocrity. For decades, the passenger train had enjoyed a virtual monopoly in American transportation. As such, it had evolved slowly—heavy, dark-colored passenger cars with drab interiors pulled by ponderous black steam locomotives were the norm.

Before the Depression, this lack of flash hadn't been an issue. Business—for the nation in general and for passenger railroading in particular—had been exceptionally good during the 1920's. Yet highway mileage and automobile ownership were steadily increasing (U.S. auto registrations jumped from 8 million to 24 million during 1920-32), and even intercity travel was becoming feasible. With the



JOHN A. GRAF

2. Streamlining

Streamlining is the shaping of something to make it aerodynamic. And while it may not have been technically as important as lightweight construction, the marketing folks knew it gave the railroads something to *sell*. The aerodynamic designs and smooth shapes of the streamlined train reduced drag, but did so significantly only at the very top end of the speed range. A much more important benefit of streamlining was the message it sent to the public—the passenger train was a modern, exciting way to travel.

The average American paid little attention to the technical advantages of diesels or lightweight construction, but the evocative image of a streamliner with smooth flowing lines from locomotive to observation car was a breath of fresh air in a nation desperate for good news. Recognizing this, railroads often applied streamlined motifs to their older heavyweight trains and steam locomotives. Airflow design may have had little impact on the performance or efficiency of a Norfolk & Western 4-8-4 or a New York Central Hudson, but it did attract crowds to the likes of Englewood, Ill., for the debut of Central's streamlined *20th Century Limited*.

VERSON SEAVER

onset of the Depression, disposable income evaporated, further emptying the trains. Some of the more progressive railroads, suddenly challenged to rebuild their business, looked for something to attract a public beginning to turn away from them. These railroads concluded that they needed to make some big changes.

This pressing need for a "new look" provided the impetus to jump-start existing ideas, advance some new ones, and accelerate all of them to the forefront. The concept of streamlining wasn't new to railroading—a streamlined train was first patented in 1865, and one was briefly tested by the Baltimore & Ohio in 1900. Likewise, internal-combustion motive power had been around for some time. As early as 1906, General Electric had mated a gasoline engine with traction motors beneath a railroad passenger car, creating the gas-electric "motor car." GE built the first gas-electric locomotive in 1913, and by 1929 both GE and the Electro-Motive Co. were producing reliable internal-combustion locomotives, albeit for slower-speed, lighter-duty applications.

RUBBER ON THE RAIL

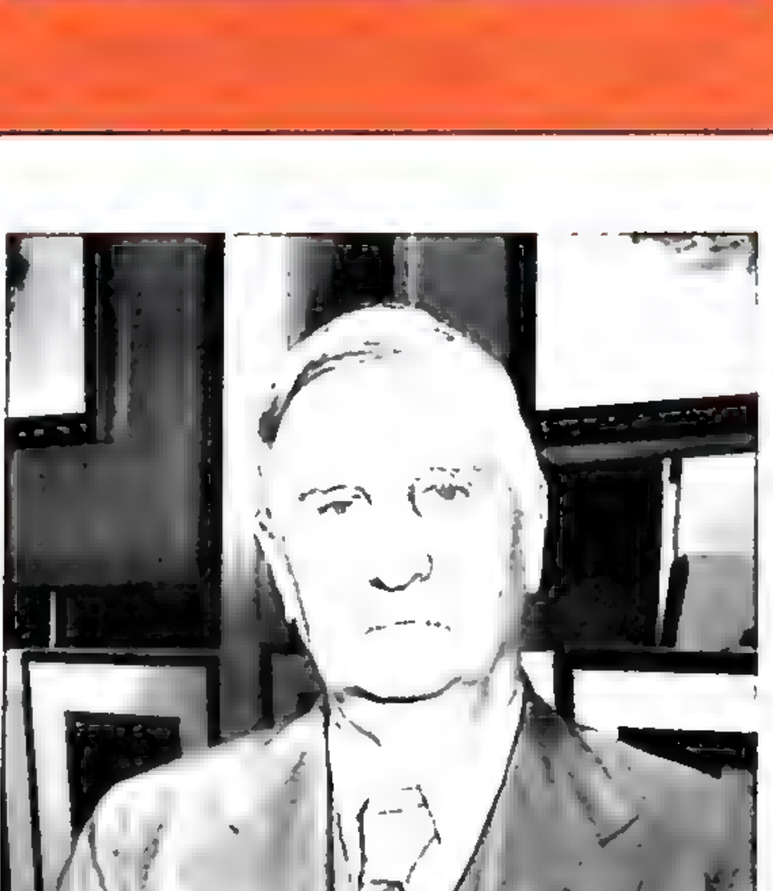
But some things were new to the game. The technology needed to build railroad cars of exotic, lightweight metals was still evolving. A revolution was also occurring in the materials used to finish car interiors, from lighting to glass to wall coverings. To stir this pot of ideas and materials and come up with a winning recipe, the railroads turned to the car manufacturers and a new breed of intermediary—the industrial designer.

With a pressing need to keep their workforces employed, the railroad-car manufacturers had a major stake in brokering change. Like the railroads, the carbuilders had been hit hard by the Depression. Nationally, passenger-car orders had averaged a healthy 2000 cars a year during the 1920's, but in 1930, orders dropped to 500 cars and over the next three years they virtually vanished. Pullman-Standard alone had the capacity to build thousands of passenger cars a year, but in

3. Lightweight construction

Not all streamliners were made of lightweight metal, but virtually all lightweight trains and cars were streamlined. From an engineering standpoint, lightweight construction was more significant than streamlining, for weight was the principal enemy of efficiency on a railroad. Lightweight materials and new, more efficient types of structural design significantly reduced weight, increasing train speed while reducing wear and tear on track and locomotives.

The first lightweight trains represented radical efforts at weight reduction. UP's three-car, 600 h.p. M-10000, built primarily of aluminum and articulated to reduce the number of wheelsets, weighed just 85 tons—less than a single heavyweight dining car. Budd's first full-sized stainless-steel coach, Santa Fe No. 3070 of 1936, weighed 42 tons. Such low weights apparently pushed the envelope a bit too far, for by the late 1930's a typical new coach weighed about 51 tons, thanks to beefed-up structural members—still a big reduction from the heavyweight era when coaches weighed 65 to 80 tons. Likewise, articulation—the sharing of trucks by adjacent cars to save weight—also fell out of favor because of the operating inflexibility it introduced; nonarticulated cars were much more easily separated for maintenance and to meet fluctuating traffic demands.



SOUTHERN PACIFIC

CLASSIC TRAINS COLLECTION

STAN KISTLER

TWO PHOTOS, CLASSIC TRAINS COLLECTION

Before railroader Ralph Budd (right) and inventor Edward G. Budd (above) teamed up to produce the *Zephyr*, most trains looked like this Santa Fe excursion train westbound near Hesperia, Calif., in 1948: a smoky black steam locomotive pulling drab, heavy, riveted passenger cars.

1932 it built a not-so-grand total of 4.

At least one carbuilder, the Edward G. Budd Manufacturing Co. of Philadelphia, also had done work for the auto industry. Edward G. Budd, the company's founder, was convinced that to compete with the auto (and draw people back to the rails), railroads needed to adapt "the conspicuous and outstanding features of the automobile." Among these features were lightweight construction and internal-combustion power. As historian Mark Reutter put it in part 2 of "The Life of Edward Budd," (*Railroad History* 173), "Budd wanted to take the lead out of the pants of railway passenger transportation." And Budd was willing to take risks to do it.

Early on, Budd had become fixated with the concept of operating rubber-tired, lightweight rail vehicles powered by internal combustion. In 1932

Stainless steel

Among the three principal metals used in lightweight car construction (the others being aluminum and Cor-Ten steel), stainless steel is viewed as the most important. It's not the lightest or cheapest metal, but because stainless is remarkably strong and durable, it is considered the premier metal—a fact which still makes it popular today for passenger cars. Gleaming stainless steel, often left unpainted as on Reading's *Crusader* of 1937, is also considered more attractive than its sister metals, which required painting.

The use of stainless steel represented in microcosm a bit of American ingenuity that the streamliner represented on a larger level. Introduced in 1912 in Germany, the combination of 18 percent chrome, 8 percent nickel, and low-carbon steel ("18-8") had been seen largely as useful only in cutlery and decoration. It took an American, Edward Budd, to recognize that stainless had great promise in the construction of vehicles. Budd's staff devised a way to assemble large structures with stainless steel. Budd called its patented process Shotwelding.

JOHN DyMOND

5. Higher speeds

Building on the sleek appearance of their new trains, the railroads were anxious to meet another public demand—faster schedules. From the very start in 1934 when the first *Zephyr* made its nonstop Denver-Chicago dash, the streamliner and speed were synonymous. Some measure of the effect that early streamliners had on the industry can be found in the numbers. In 1930, American passenger trains operated at an average speed of 60 mph or more for only 1,100 miles daily. By 1940, six years into the streamline era, the 60-plus-mph mileage figure had soared to 75,000 per day! Milwaukee Road timetables showed trains covering the 85-mile Chicago-Milwaukee run in 85, 80, even 75 minutes.

after devising a pioneering method for using stainless steel for car construction, Budd completed the "Green Goose," a rubber-tired, stainless-steel rail motor car powered with a gasoline engine taken from Budd's own Chrysler Imperial auto.

Encouraged, in 1932 Budd approached established carbuilders with the idea of mass-producing stainless-steel railroad motor cars. The builders failed to take interest, so Budd became his own contractor and marketer.

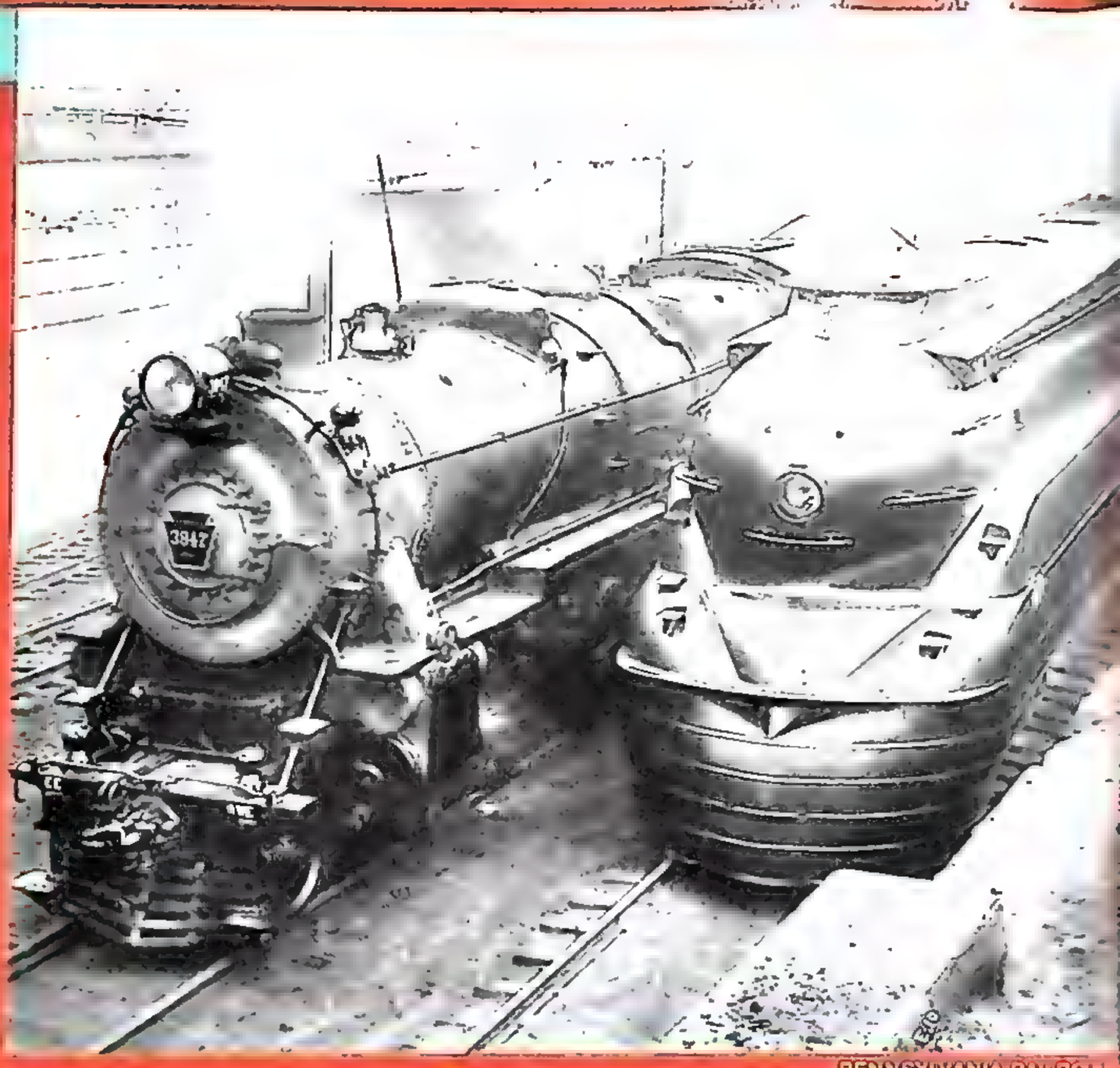
That same year, Budd sold stainless-steel, rubber-tired motor trains to both of his hometown railroads, the Reading Company and the Pennsylvania Railroad. Faraway Texas & Pacific also took a three-car trainset, with a power car equipped with steel wheels. Serious defects with the tires and engines led the Reading and T&P to scrap their trains within a year. PRR re-engined its train and replaced the rubber tires with steel wheels, a key improvement. As re-equipped, the little train ran in PRR service until 1948 before being sold and finally retired in 1952. The poor performance of Budd's early motor trains could have been the death knell for the concept of streamlined, lightweight passenger trains, but Budd refused to give up. Another man named Budd gave him a reason to be glad he hadn't.

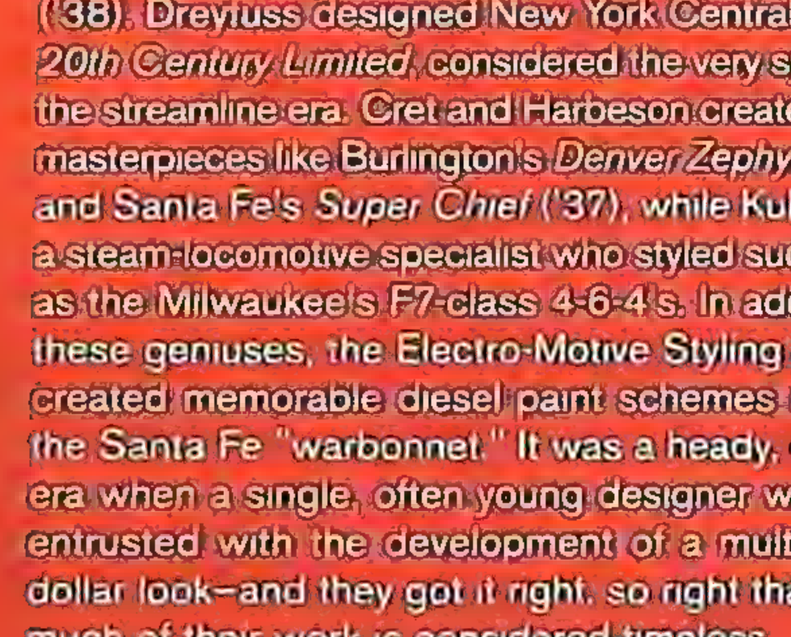
THE OTHER BUDD

Having lost 33 percent of its passenger traffic since 1929, the Chicago, Burlington & Quincy was desperate to gain ridership and control costs, especially on its branch lines. Burlington Route's president, Ralph Budd, a very distant relative of Edward Budd, paid a visit to Philadelphia in

6. Industrial designers

What modernized the image of the railroad more than anything else was a whole new influence: industrial design. Part artist, part architect, part engineer, industrial designers like Raymond Loewy, Henry Dreyfuss, Paul Cret, John Harbeson, and Otto Kuhler put a modern face on a stodgy old industry—and they did it almost overnight. Loewy was hired to update the image of the conservative Pennsylvania Railroad. He provided such memorable designs as the GG1 electric locomotive (1935), streamlined K4s ('36, right), and the Fleet of Modernism ('38). Dreyfuss designed New York Central's 1938 *20th Century Limited*, considered the very symbol of the streamline era. Cret and Harbeson created Budd masterpieces like Burlington's *Denver Zephyr* (1936) and Santa Fe's *Super Chief* ('37), while Kuhler was a steam-locomotive specialist who styled such gems as the Milwaukee's F7-class 4-6-4's. In addition to these geniuses, the Electro-Motive Styling Section created memorable diesel paint schemes such as the Santa Fe "warbonnet." It was a heady, creative era when a single, often young designer would be entrusted with the development of a multi-million dollar look—and they got it right, so right that today much of their work is considered timeless.





DON WOOD

7. Roller bearings

All those fast diesels and lightweight, streamlined cars wouldn't have rolled as we or as fast as they did without roller bearings on their wheels. The products of SKF an Timken did much to ensure the smooth, safe rolling qualities of the new equipment, n creasing the possibility of faster runs. "Rollers" replaced the need for constant journal-bea ng maintenance, which, when overlooked, could have devastating consequences—like th 1943 wreck of Pennsy's *Congressional* because of a journal which burned off at hig speed, killing 79. An anonymous tribute to the efficiency of this little-remarked improvemen could be found in railroad operating departments that kept lists of cars approved for high-spee operation. The lists almost always included the notation "Roller Bearing Equipped."

1932. A true visionary, Ralph Budd rode the Green Goose and came away convinced that stainless steel was the future of passenger-car construction.

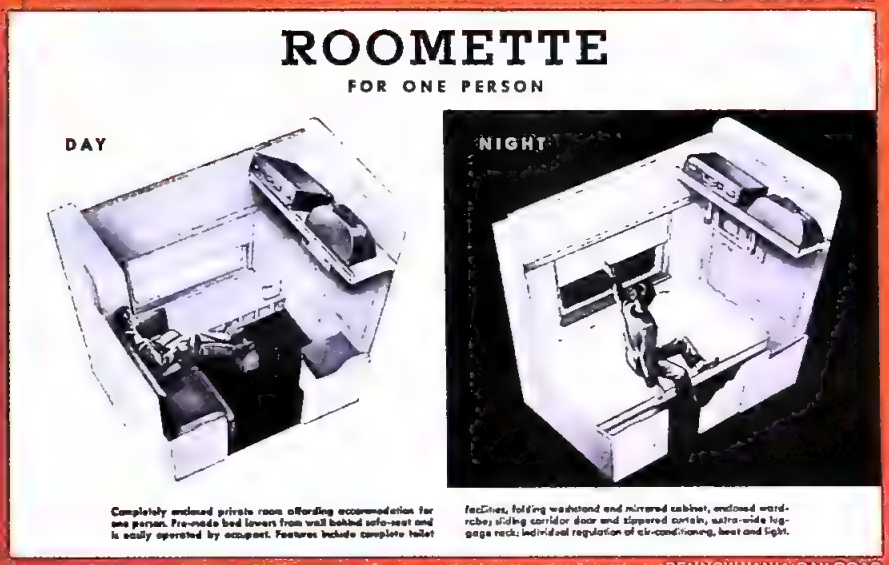
In 1933, the Burlington placed an order with Budd for a "high-speed, lightweight streamlined passenger train." The requirements of the contract included elements that would remain hallmarks of passenger-train construction to this day: stainless-steel construction, steel wheels, and diesel power. The difference between

Spectators get a glimpse of the future as CB&Q 9900, the first *Zephyr*, rolls into Burlington, Iowa, during its nonstop dash from Denver to Chicago on May 26, 1934.

The roomette

Nothing symbolized the old days like the Pullman "section" With its heavy green curtains, lack of privacy with two strangers seated facing each other by day, and claustrophobic upper berth, the section was rapidly falling from favor as the 1930's dawned. So imagine passengers' delight when Pullman unveiled the "roomette" in 1937. Here between two walls and behind a door for privacy were a comfortable seat, a picture window, a bed that folded up into the wall, a sink, and a toilet—eliminating that walk down the hall to a communal restroom. The new accommodation symbolized the modern era. Pullman used the roomette, designed for the single traveler, in many of the overnight streamliners it built in the prewar period, such as PRR's *Broadway*, NYC's *Century*, and SP's *Lark*.

NEW YORK CENTRAL


ROOMETTE
FOR ONE PERSON
DAY
NIGHT
Completely enclosed private room affording accommodation for one person. Pre-made bed lowers from wall behind sofa-seat and is easily operated by occupant. Features include complete toilet facilities, folding washstand and mirrored cabinet, enclosed wardrobe; sliding corridor door and zippered curtain; extra-wide luggage rack; individual regulation of air-conditioning, heat and light.
PENNSYLVANIA RAILROAD

the new train and Budd's earlier motor trains was like a Ferrari compared with a Soapbox Derby car.

Budd threw everything it had into the Burlington project. Ingeniously, the manufacturer used the roof of the car, not the center sill, as the car's primary structural member, saving many thousands of pounds of weight. The three-car train's graceful exterior fluting was a far cry from the crude fluting of the company's earlier motor cars. Fluid streamlining with a slanted nose, skirted trucks, and a tapered tail all conspired to reduce drag by 50 percent at 95 mph.

Then there was the motive power. At Burlington's instigation, the new train's power car sported a 660 h.p., two-cycle diesel developed by General Motors affiliate Winton Engine Corp. under the guidance of Charles Kettering and Harold Hamilton. Unlike the engines in earlier Budd efforts, this was a very reliable power plant. Finally, the interior was created by legendary architect and industrial designer Paul Cret, whose clean and thoroughly modern styling gave the train a look unlike anything on the rails.

Dubbed *Zephyr* for the mythical Greek god of the west wind, the train was delivered in April 1934. Burlington intended to use it on its Omaha-Kansas City route, but first, the new streamliner toured the country on what became a remarkable seven-month odyssey. Looking like something straight out of Buck Rogers and a sight for Depression-weary eyes, the *Zephyr* galvanized public attention to the concept of streamlined trains.

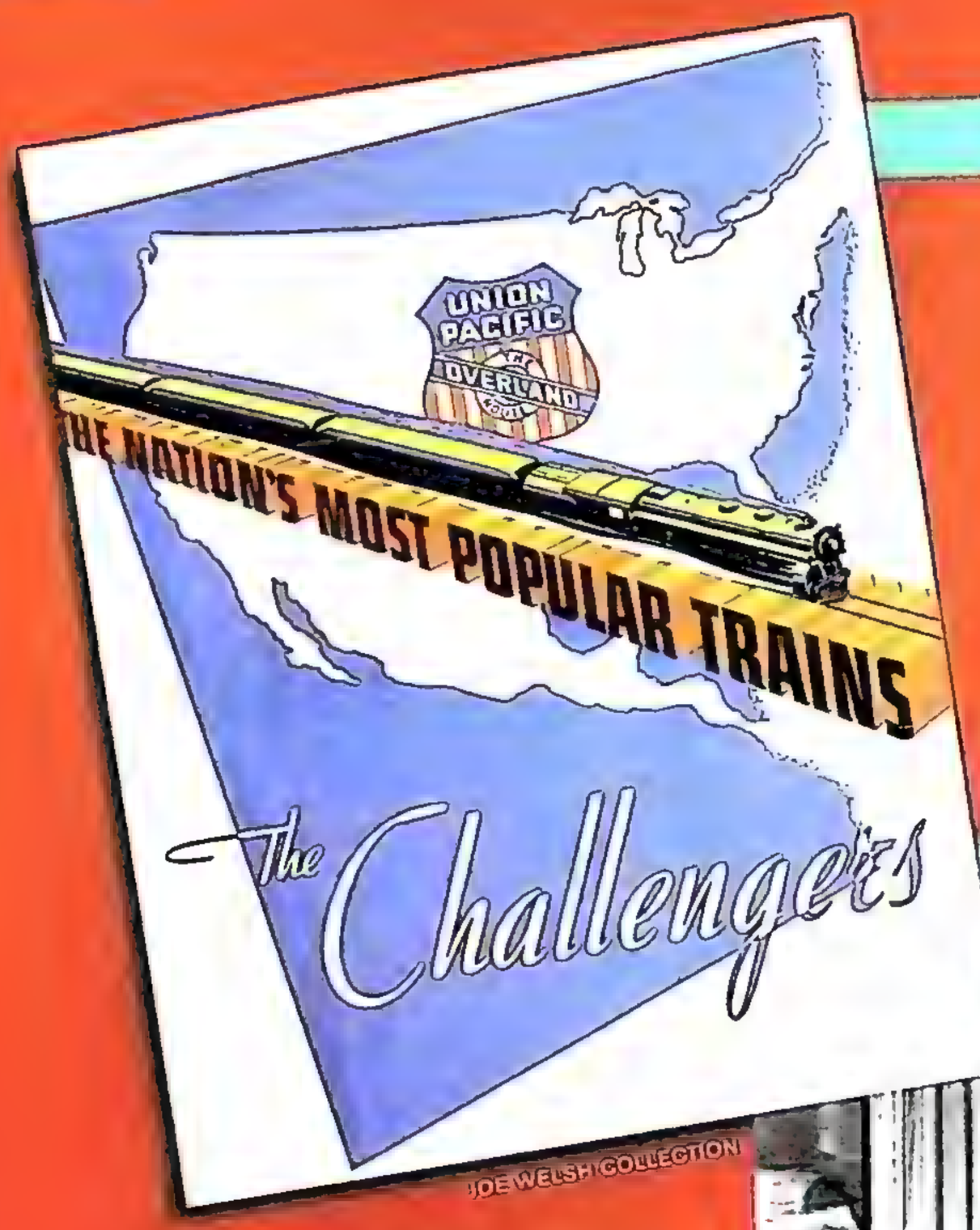
The most famous segment of its tour was a stroke of promotional daring and genius. This occurred on May 26, 1934, when the *Zephyr* zoomed east on a dawn-to-dusk, nonstop run from Denver to Chicago. Thousands of Americans followed the train's progress by radio broadcasts. When the dash was done, the *Zephyr* had completed the 1015 miles at an average speed of 77.6 mph, setting world records for speed and endurance.

At the same time, Union Pacific and Pullman-Standard were following a similar course. In February 1934, UP had introduced the aluminum M-10000, a three-car articulated train built by P-S and powered by a Winton distillate engine. Though most trains of the future would be built of steel, not aluminum, and would employ diesel, not distillate, propulsion, the M-10000 was, by a couple of months, the first streamliner in America. It also toured the country and had much the same impact as the *Zephyr*. Drawing thousands to trackside, "Little Zip," as its crew called it, was even viewed by President Franklin D. Roosevelt. An era was truly beginning.

THE WINDS PICK UP

The public-relations success of the two pioneering trains provided direct inspiration for whole fleets of streamliners. The M-10000 led to the development of the *City of Portland*, Pullman-Standard's second—and the first long-distance—streamliner. Powered by GM-Winton diesels, it provided the first sleeping accommodations in a streamlined train. UP and its partner roads (C&NW on the east, Southern Pacific to San Francisco Bay) would introduce an entire fleet of prewar streamliners linking Chicago with Los Angeles, Denver, and San Francisco.

Even before the first *Zephyr* entered regular service, Burlington ordered two more lightweight trains, which would become the *Twin Zephyrs* between Chicago and the Twin Cities of Minneapolis-St. Paul. A fleet of prewar *Zephyrs* followed, the crown jewel of which was the *Denver Zephyr*, whose original 12 cars included two power cars plus sleeping, coach, and full dining accommodations. The success of the *Zephyrs* literally rescued the Budd Company from



JOE WELSH COLLECTION

9. Budget-priced

The new streamliners may have b[een] attra[ctive], but they were being introduced in the heart of the Depression. To pull in passengers, the railroads shifted their focus from expensive first-class travel to more-affordable coach class. The extra touch of genius the railroads applied was to ensure that coach passengers would *feel* first-class. Attractive coach interiors, cars reserved for women and children, free pillows, tasty yet low-cost meals, and the ministrations of an attentive staff including stewardess-nurses all were aimed to entice budget-minded travelers.

The first train to feature this approach was UP's *Challenger* of 1936, a wildly successful operation despite its heavyweight equipment. But the idea quickly spread to other services, including lightweight coach streamliners like Santa Fe's *El Capitan*, Seaboard's *Silver Meteor*, and Atlantic Coast Line's *Champion*.

SANTA

CLASSIC TRAINS COLLECTION

the brink of financial ruin. The other established builders such as Pullman-Standard and American Car & Foundry benefited from the streamliner as well.

New lightweight and streamlined trains evolved and proliferated in the prewar period on many railroads. By the time World War II put a temporary end to streamliner construction the railroads had built new or "streamstyled" hundreds of cars, creating dozens of streamlined trains.

CONVINCING THE DOUBTERS

Railroads had been living in their own insular world for decades, so at first not all of them embraced the new train concepts. Some questione[d]

The first streamliner, Union Pacific's Pullman-built M-10000, stands on display at Chicago's Century of Progress in 1934.

With their beautiful exteriors and faster speeds, the prewar streamliners practically sold themselves. But just to make sure they did sell, the railroads and the manufacturers planned elaborate nationwide tours, staged zany maugurals, and distributed voluminous advertising. The tours of the early *Zephyrs* and the UP fleet galvanized public attention. Amazing maugurals featured buzzing biplanes, brass bands, costumed participants, and goofy stunts. Burlington split up 44 sets of twins between its identical *Twin Zephyrs* and ran the two trains side by side down its main line. ACL planned to release homing pigeons that would fly back to New York with a message upon the *Champion*'s first arrival in Miami in 1939, but the idea was nixed at the last minute. Coast Line rival Seaboard christened its *Silver Meteor* with a costumed girl touching the train with a magic wand which gave off sparks!

Little remarked was the work the manufacturers did to ensure that the railroads bought streamliners in the first place. Assiduously courting the press and chambers of commerce, they astutely generated pressure on the railroads to modernize by buying their products

BURLINGTON ROUTE

The safety of lightweight construction, or were unimpressed with the ride characteristics of lighter cars. But as the 1930's waned, even the holdouts were swayed by the marketing value of new trains.

Baltimore & Ohio bought new lightweight cars for its *Royal Blue* in 1935. It soon replaced them with streamstyled heavyweights, and then did the same for other trains including its flagship *Capitol Limited* between Washington and Chicago. Atlantic Coast Line saw its Florida passenger-train revenues decimated when rival Seaboard Air Line introduced the streamlined *Silver Meteor* in 1939, so the Coast Line followed suit and reaped significant profits. By 1941, the conservative Southern Railway was dragged into the streamlined passenger-train business under pressure from people in Atlanta, who didn't want theirs to be the only big city in the South served only by old-fashioned trains.

While all these new cars and trains typically represented only a fraction of any given railroad's fleet, they had an impact far beyond their number. The railroads often discovered that their new trains attracted standing-room-only patronage. At one point, for example, the Florida roads found their new Budd coach streamliners so popular they were the subject of a ticket-scalping scheme among Florida hotel employees aimed at making money off of travelers who simply *had* to ride the new trains!

Marketing research revealed other encouraging trends. Many of the streamliners' passengers had abandoned other forms of travel, including the auto, to take the train. On routes where a streamliner had been installed, even the ridership of its heavyweight running mates typically improved.

It's important to note, however, that the streamliner did not ultimately reverse the downward trend in ridership of the American passenger train. Between 1930 and 1940, railroad passenger traffic decreased from 29 billion passenger-miles (one passenger carried one mile) to 25 billion. Likewise, the industry lost market-share to the auto and the intercity bus. In 1930, railroads operated 74.6 percent of all passenger-miles in the country; by 1940 the figure was 67.1 percent.

A more accurate interpretation of the prewar streamliners' impact is that they clearly took the edge off the harsh slide in rail ridership of the early 1930's. In the process, American railroads created a popular cultural icon recognized today as industrial art.

Streamliner SNAPSHOTS

51

Great grilles, and articulation

GREEN DIAMOND: Big front-end radiator grilles and articulated consists characterized the Union Pacific and Illinois Central diesel trains built by Pullman-Standard and powered by EMC. At right, IC's one-of-a-kind, fully articulated *Green Diamond* stops at Kankakee, Ill., on November 13, 1941, during its regular run between St. Louis and Chicago.

TWO PHOTOS: DAN PETERSON; AL CHIONE COLLECTION

CITY OF DENVER: Union Pacific's first three streamliners, M10000-M10002, had semicircular, turret-style cabs and bulbous radiator grilles. More stylish were the chromed, automobile-influenced M10003-M10006. Here No. CD-06 (formerly M10006) heads up the *City of Denver* at Sand Creek Junction, Colo., near the end of its run from Chicago. The date is June 29, 1952, and this original 1936 equipment will be retired the following year.

Crafting the lightweight Super

Santa Fe's six years under the leadership of forward-looking Samuel T. Bledsoe were revolutionary in more ways than one

BY **LARRY E. BRASHER**

BETWEEN 1933 AND 1937, several revolutionary designs and new manufacturing techniques came together on the Atchison, Topeka & Santa Fe Railway to produce an outstanding example of technological advancement by an American industry. The result was the celebrated *Super Chief*.

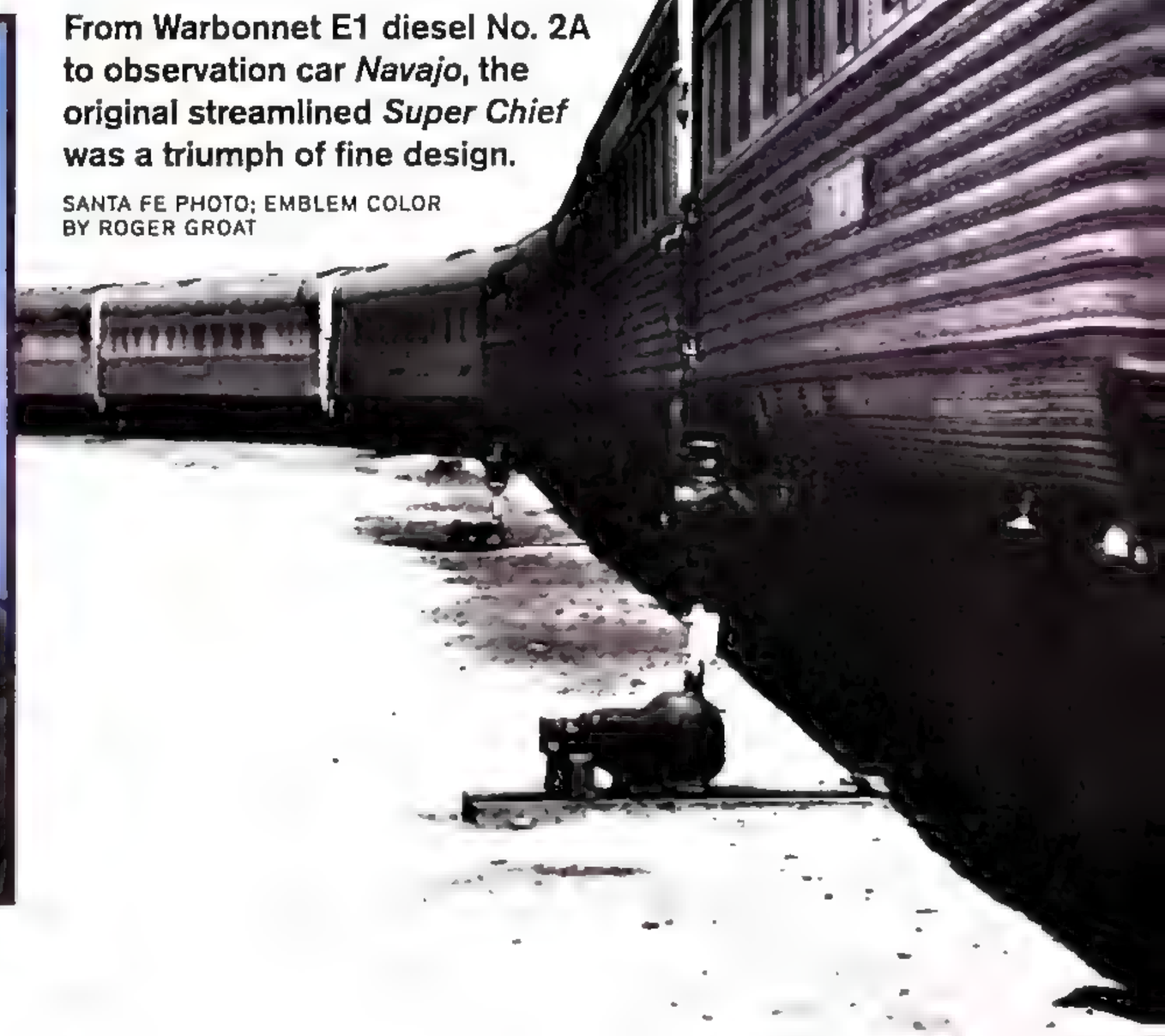
This classic train, a gleaming stainless-steel streamliner powered by E1 diesels that introduced the famous red-and-yellow "Warbonnet" livery, did not spring full-blown into service, though. "The Super" became a streamlined, lightweight train in 1937 after a three-and-a-half-year development period.

The nurturing of the corporate environment necessary for the train's creation began with the authorization for expenditures to air-condition existing standard ("heavyweight") passenger cars granted by the Santa Fe board of directors to President Samuel T. Bledsoe on November 28, 1933. The truly creative period began the following year, when Bledsoe requested funding for the diesel locomotives that would become the power for the first *Super Chief*.

In 1935, Bledsoe requested more money for the creation of experimental lightweight passenger cars. The funding was approved, allowing design and production work to commence. The next year, Bledsoe again went to the board and requested funds to buy new lightweight rolling stock and diesel locomotives to create a new, luxurious Chicago-Los Angeles train. The creative journey culminated on May 18, 1937, with the debut of a wholly new, lightweight *Super Chief*.

William Benson Storey had retired as president of the Santa Fe on May 2, 1933. He had been in office at the beginning of the Depression and was said to be exhausted from the workload imposed by his successful endeavors to maintain the road's

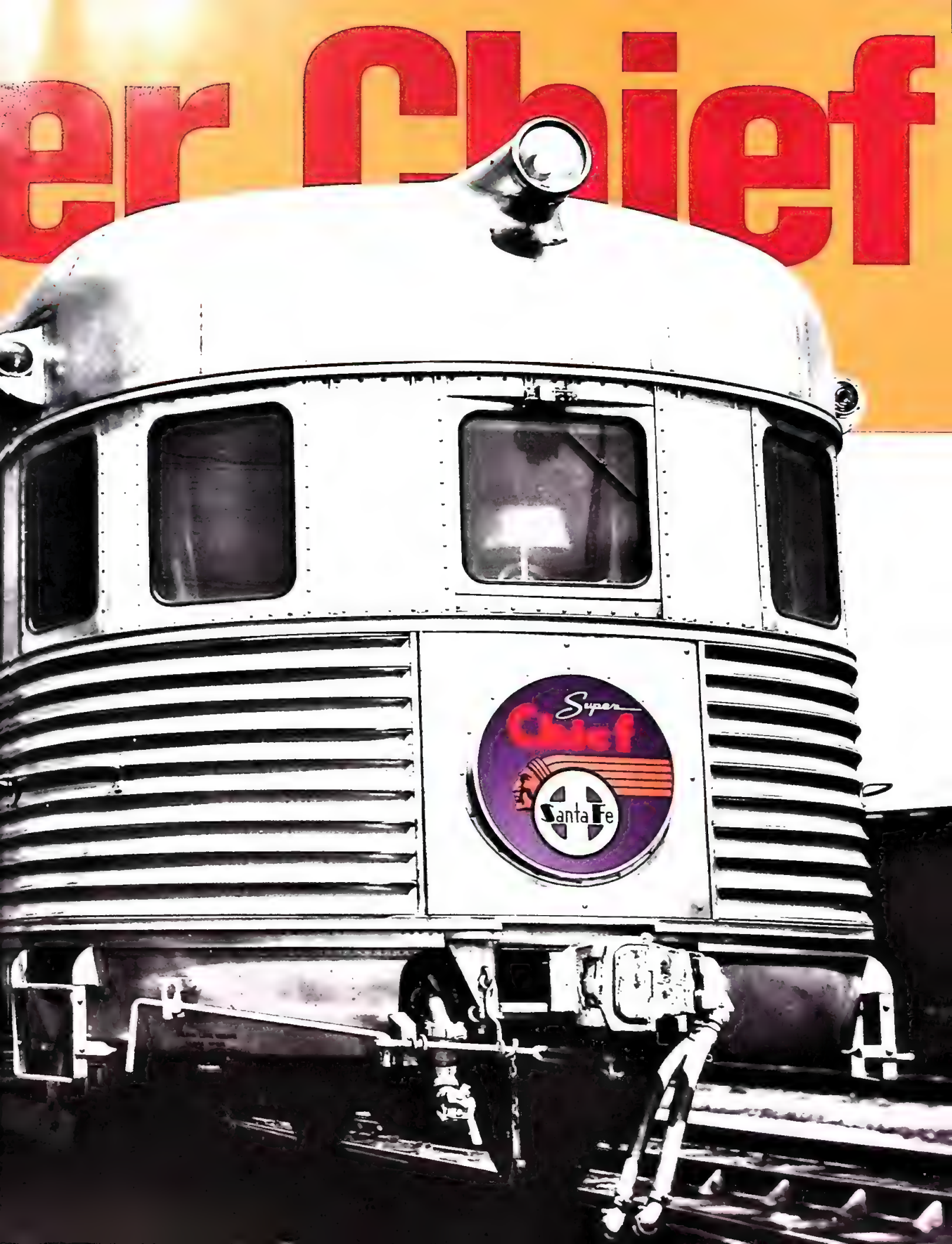
C. H. KERRIGAN PHOTO, AL CHIONE COLLECTION



From Warbonnet E1 diesel No. 2A to observation car *Navajo*, the original streamlined *Super Chief* was a triumph of fine design.

SANTA FE PHOTO; EMBLEM COLOR BY ROGER GROAT

er Chief



solvency. In the midst of the economic slump, Storey was succeeded by Samuel T. Bledsoe, a forward-looking executive.

Bledsoe was not a railroad man in the tradition of his predecessors Storey, Edward Payson Ripley, and William Barstow Strong, all of whom had hands-on operating experience before being named president. Bledsoe came to the presidency with a strong background in law, specializing in land and railroad legal matters. Perhaps because he had no direct operating experience, Bledsoe was never reluctant to take on new technology. In his six years leading the Santa Fe, he demonstrated an enthusiasm for it, and for the required monetary investment in it. Not only did he direct the acquisition of new, advanced locomotives (both steam and diesel), he instituted new high-speed, streamlined passenger service and spent large sums on improving the physical plant and modernizing the right of way to accommodate it.

The drastic reduction in business activity and personal travel brought about by the Depression severely affected freight and passenger service. Losses were exacerbated by three factors: the rapid rise in private auto ownership, which pummeled intrastate passenger patronage; the fledgling air-transport industry; and the expansion of the interstate trucking industry, which cut freight revenues, especially less-than-carload business.

In 1929, Santa Fe's operating revenue was $267.2 million, yielding income of $61 million. By 1932, the figures had dropped to $133 million and $7.5 million, respectively. These issues and numbers were the focus of attention for President Bledsoe and W. K. Etter, vice president, operations. They were aware of both the need for advanced locomotive technology for faster freight schedules that would recover lost traffic, as well as the need to boost passenger patronage.

At the Santa Fe directors meeting of November 28, 1933, Bledsoe brought up the first of his many suggestions for improving passenger service. Since the railway's Chicago-Los Angeles route traversed the hot desert Southwest, Bledsoe pushed the idea of using air-conditioning passenger cars. The board agreed and approved the expenditure.

And spend he did. During 1934, Santa Fe installed the new steam-ejector air-conditioning system in 66 cars: 18 club-lounges, 4 café-observations, 14 dining cars, 13 Pullman room cars, and 17 Pullman observation cars. Counting the 23 dining cars Santa Fe previously had air-conditioned, the railway was operating 89 air-conditioned cars by the end of 1934. This was the first of a series of decisions that would see Santa Fe offering one of the finest and fastest long-distance passenger-train fleets on the continent.

On May 29, 1934, Bledsoe convinced the board to approve the air-conditioning of 30 Pullman sleeping cars. The following year Santa Fe added even more air-conditioned standard Pullman sleepers, club-lounges, and diners to its fleet. The estimated cost of each car's conversion: $8000.

BOX-CAB DIESELS AND HEAVYWEIGHT CARS

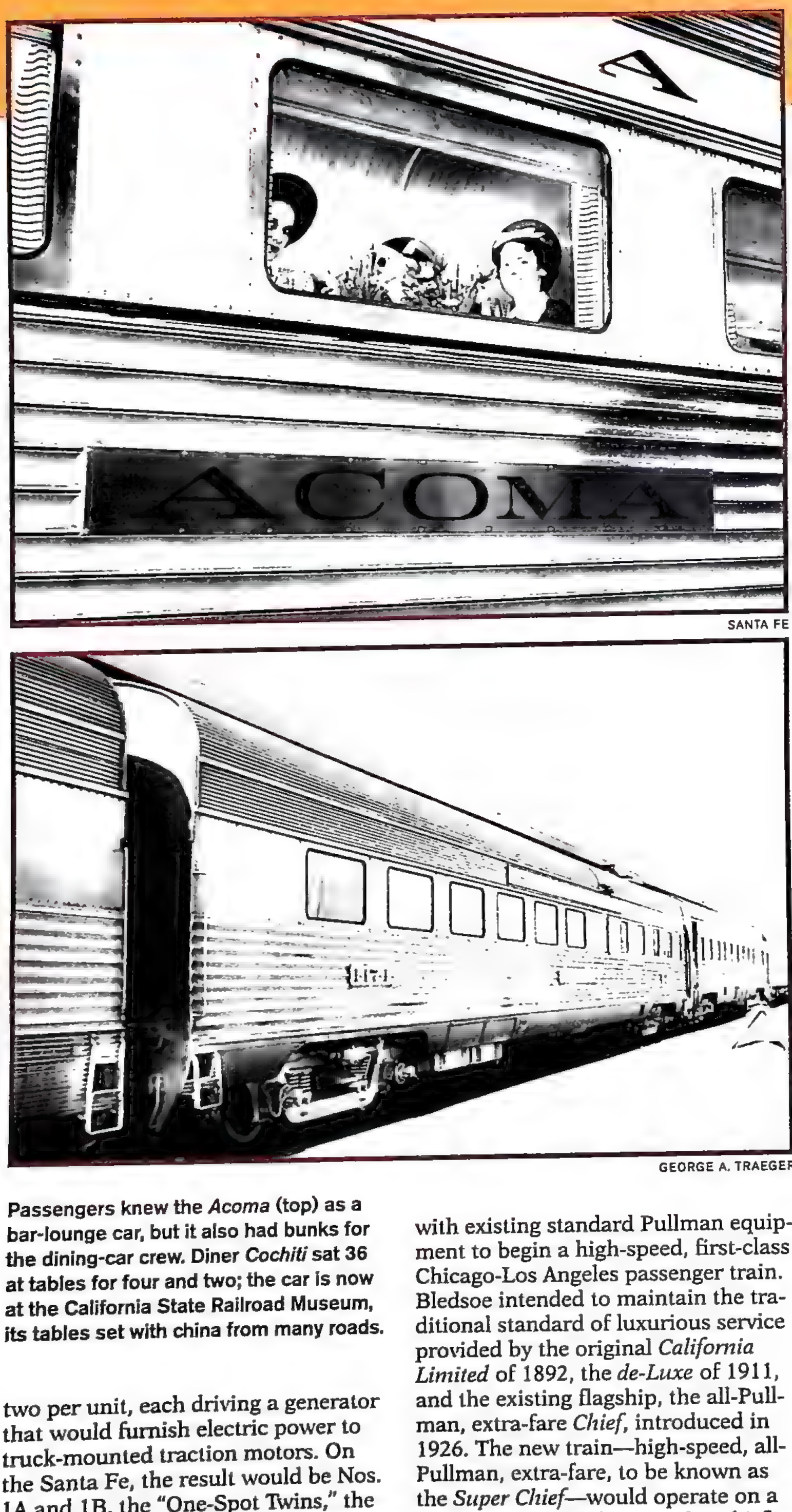
Having introduced air-conditioned comfort for first-class passengers beyond dining cars, Bledsoe then turned to motive power. He was aware of the new diesel-electric demonstration locomotive in the planning stages at Electro-Motive Corp., whose chief engineer, Richard Dilworth, had conceived and was working on the concept of a multiple-unit locomotive.

This machine would incorporate his untried idea of a diesel-powered mainline locomotive with an enclosed body and main frame fabricated from structural steel. Dilworth was intent on creating a 3600 h.p. multiple-unit locomotive powered by four of the new 900 h.p. Winton 201A diesel engines,

Having left Chicago's Dearborn Station two days earlier, the inaugural run of the *Super Chief* rolls into Pasadena, Calif., on May 14, 1936. The boxy "One-Spot Twins" head up the all-heavyweight consist.

The *Super*'s box-cabs and heavyweights gave way to streamlined E1 diesels and stainless-steel cars in May and June 1937. Though no more powerful than the One-Spots, the E's were miles ahead in styling.

TWO PHOTOS SANTA FE



Passengers knew the *Acoma* (top) as a bar-lounge car, but it also had bunks for the dining-car crew. Diner *Cochiti* sat 36 at tables for four and two; the car is now at the California State Railroad Museum, its tables set with china from many roads.

two per unit, each driving a generator that would furnish electric power to truck-mounted traction motors. On the Santa Fe, the result would be Nos. 1A and 1B, the "One-Spot Twins," the fourth and fifth such 1800 h.p. box-cab units built by Electro-Motive, in September 1935.

Bledsoe conceived the idea of marrying EMC/Winton's new technology with existing standard Pullman equipment to begin a high-speed, first-class Chicago-Los Angeles passenger train. Bledsoe intended to maintain the traditional standard of luxurious service provided by the original *California Limited* of 1892, the *de-Luxe* of 1911, and the existing flagship, the all-Pullman, extra-fare *Chief*, introduced in 1926. The new train—high-speed, all-Pullman, extra-fare, to be known as the *Super Chief*—would operate on a 40-hour schedule, beating the *Chief*'s time by 15 hours. The *Super Chief* actually would operate on a schedule of 39¾ hours, an average of almost 56 mph for its 2224-mile route.

On September 11, 1934, the Santa Fe board, after hearing Bledsoe's presentation of his revolutionary proposal, authorized the purchase of a 3600 h.p. diesel locomotive at a cost not to exceed $400,000. In the short term, the new locomotive would pull a *Super Chief* equipped with heavyweight cars, but Bledsoe believed that lightweight equipment was the future of passenger service.

He was also well aware of the success of Chicago, Burlington & Quincy's lightweight, stainless-steel, diesel-powered *Zephyr*, completed earlier in 1934 by the Edward G. Budd Co. of Philadelphia. The *Zephyr*'s construction was based on the new manufacturing technique known as Shotwelding, a system perfected and patented by Budd's chief engineer, E.J.W. Ragsdale. This allowed stainless steel to be assembled without compromising its inherent strength and without marring the surface of the material. Budd lightweight cars employed a basic stainless-steel truss structure and stainless corrugated exterior sheeting, which increased stiffness.

This construction had been proven to be safe and effective in the *Zephyr*, and Bledsoe was convinced this approach was the solution to the challenge of reducing car weight. Wisely, though, Bledsoe wanted no part of the comfort or operational limitations imposed by the *Zephyr*'s smaller-than-standard, articulated cars.

On June 25, 1935, Bledsoe received board approval for a maximum expenditure of $200,000 for "diesel engines and light passenger cars." The diesels would be switchers, not a new concept, but the cars would be the first of a fleet of non-articulated, standard-size, lightweight rolling stock.

In January 1936, Budd delivered to Santa Fe for testing one lightweight stainless-steel 52-seat coach, No. 3070. It was the builder's first non-articulated, full-size, stainless-steel passenger car, and would be the prototype for many hundreds of siblings to follow. Fully equipped and ready for service, it weighed 83,500 lbs., about half that of a standard 160,000-lb. chair car. Santa Fe's experience with 3070 later in the year led the company to order from Budd the first lightweight *Super Chief* trainset.

This wasn't the only project spawned by coach 3070. Three years before, Lawrence J. Brasher, a machinist and the author's father, submitted a detailed proposal for a dedicated Chicago-Los Angeles train offering all chair-car service. The experience with the 3070 led Charles T. Ripley, Santa Fe's chief mechanical engineer, to suggest a lightweight version of a high-speed, but lower-fare, Chicago-L.A. train. This resulted in the all-coach *El Capitan* of 1938.

Eleven months after Budd delivered the 3070, Santa Fe accepted another lightweight chair car, 98,000-lb. smooth-side 3071, constructed of Cor-Ten steel by St. Louis Car Co. This car did not, however, influence the design of the *Super Chief* already under construction in Philadelphia.

BLEDSOE'S AUDACIOUS PROPOSAL

Despite a major fire on one of the EMC "One-Spot Twins" during a November 1935 preliminary run of the heavyweight *Super Chief*, an undaunted Bledsoe presented his board with an audacious proposal on February 25, 1936—to equip six trainsets for Chicago-Los Angeles service, each with a diesel locomotive. The board approved a $5.5 million expenditure for this.

One lightweight sleeping car, *Forward*, Pullman's first, had been put in test use in the heavyweight *Super Chief* in November 1936. *Forward* was due to be returned to Pullman in January 1937, but it was so successful that Santa Fe never let it go, purchasing it outright later in 1937. *Forward* served in revenue service until it was designated as a dormitory car in 1963.

Launched on May 12, 1936, the heavyweight *Super Chief* didn't last long—it was less than a year old when Santa Fe received the first lightweight set, of nine cars, from Budd in April 1937. The cars were tested extensively before entering scheduled service.

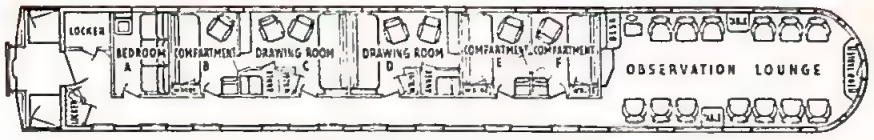
This trainset was initially equipped with American Steel Foundries slack-control couplers, but during the first movement of the coupled train at Budd, accidental uncouplings occurred, so necessary adjustments resulted in a delivery delay. The air-conditioning was of the steam ejector type as made by Vapor and Safety Car Heating Co. All the trucks were four-wheel with individual brake cylinders and clasp brakes; standard Westinghouse Air Brake equipment was successfully adapted to this high-speed operation.

Designed and built as part of the original set, lightweight Railway Post Office car 3400 did not enter service on the *Super Chief* because the Post Office Department required operation of mail-service equipment only on daily scheduled routes, and the *Super* ran only once a week. Although 3400 was tested as part of the nine-car set, it was then assigned to pool service.

The first lightweight *Super Chief* consisted of a baggage car; two 8-section, 2-compartment, 1-drawing room sleepers; a bar-lounge-dormitory; a dining car; two 6-bedroom, 2-compartment, 2-drawing room sleepers; and an observation-lounge 3-compartment, 2-drawing room, 1-bedroom sleeper.

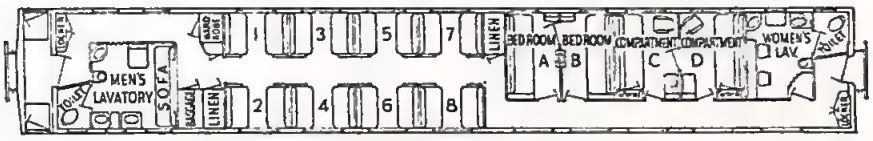
This consist was assigned to trains 17 and 18 throughout 1937. The entire train was serviced and turned at Chicago and Los Angeles after each run. This pattern, already established with the heavyweight *Super Chief* in 1936 and which allowed for the addition of equipment to handle increased passenger loads, would last substan-

Cars of the lightweight Super Chief



3 Compartments — 2 Drawing Rooms — 1 Double Bedroom — Observation

2 Drawing Rooms — 2 Compartments — 6 Double Bedrooms



8 Sections — 2 Compartments — 2 Double Bedrooms

Club Lounge Car

Name/No.	Car type	Weight (lbs.)*
3430	Baggage	75,060
Isleta	Sleeper (8-section, 2-compartment, 1-drawing room)	104,900
Laguna	Sleeper (8-section, 2-compartment, 1-drawing room)	104,900
Acoma/1370	Bar lounge-dormitory	96,940
Cochiti/1474	Diner	110,200
Oraibi	Sleeper (6-bedroom, 2-compartment, 2-drawing room)	107,500
Taos	Sleeper (6-bedroom, 2-compartment, 2-drawing room)	107,500
Navajo	Observation lounge-sleeper (3-compartment, 2-drawing room, 1-bedroom)	102,260

* Weights do not include fuel, interior supplies, or people. Weights do include ice and water.

Inside the *Super*: The section accommodations (above) in *Isleta* and *Laguna* indicate that the 1937 train just predated the all-private-room era. A view in *Navajo* (right) looks forward from the observation lounge toward the Pullman rooms. Two photos of lounge-dorm *Acoma* (opposite page) look toward and away from the bar.

tially unchanged for the *Super Chief* and *El Capitan* until the *Super*'s takeover of the *Chief*'s transcontinental sleepers in 1954.

Naturally, the riding qualities of the new cars were of great importance. During testing in 1936, noise and vibration levels inside cars were carefully monitored. Structural vibration was also a concern, and was recorded by specially installed equipment. Some harmonic vibration was noted and considered to be "possibly a function of this type construction." The data was also compared to earlier information from lightweight German railway equipment.

Equally important, high-speed braking tests were conducted. Stopping distance was a critical factor. As part of the big Santa Fe physical-plant modernization begun in 1935, signals had been adjusted for the high speed of the original heavyweight *Super Chief*. Brakeshoe wear was monitored, and brake-line and brake-cylinder pressure adjusted to allow maximum braking efficiency without sliding the wheels, a significant danger, especially at high speed, because any imperfection in track structure encountered by a non-rotating wheel could result in a derailment.

Coal-fired Pacific 3420 was used in testing on the Illinois Division, which confirmed that fuel consumption was 8 percent less and running time 12 percent faster with lightweight cars as compared with heavyweight cars. Steam performance was of great interest because several new trains being contemplated for introduction in 1938 with lightweight cars would have to be powered initially by steam locomotives. The test data indicated that all aspects of steam performance and economy benefited significantly from lightweight cars. The nine-car train as tested weighed 45 percent less than a similar heavyweight train.

WARBONNET AND STAINLESS STEEL

The first run of the streamlined, stainless-steel *Super Chief* with its intended motive power occurred on June 15, 1937. Heading the train were Electro-Motive's first E1 diesels, a brand-new A-B duo numbered Santa Fe 2A and 2B. No. 2A was an E1A, with a control cab; 2B was a cabless E1B. They were the first diesels to wear the famous "Warbonnet" paint scheme of red, yellow, and silver, with black accents, designed by EMC illustrator Leland A. Knickerbocker.

Direct descendants of the box-cab One-Spot Twins of September 1935, the 2A and 2B together weighed 287 tons and had a combined length of 141 feet, 4 inches. Tractive power of each unit was approximately 91,000 lbs. at starting. The units were geared for an astonishing top speed of 116 mph. Each rode on two A1A trucks, meaning the center axle of three on each truck was not powered. The E1 cab unit shared the sloped nose introduced several weeks earlier on six similar EA's for Baltimore & Ohio.

EMC was late in delivering the E1's, as the lightweight train itself had actually debuted a month earlier. Its first exhibition run, to Santa Fe, N.Mex., was behind steam, while the One-Spot Twins handled the special introductory run from Chicago to Los

FOUR PHOTOS SANTA FE: DAVID LUSTIG COLLECTION

Angeles and return, as well as the regularly scheduled runs from May 18, 1937, into mid-June.

The L.A.-Chicago return leg of the introductory special—powered most of the way by the short-lived trio of box-cabs 1A, 1B, and 1C—was made in 36 hours, 20 minutes, setting Santa Fe's all-time passenger speed record. At the time, Santa Fe press releases and magazine articles ignored this fact, which led to later historical confusion, as the record run attributed to 2A and 2B were in reality the work of the Twins and 1C. (In July 1936, one of the original 1800 h.p. demonstrator units, EMC No. 512, was leased from Electro-Motive for use as a relief unit on the *Super Chief*. Carried as No. 1C while on the Santa Fe, and closely related to ATSF 1A and 1B, she took part in early experiments in the operation of three units in multiple.)

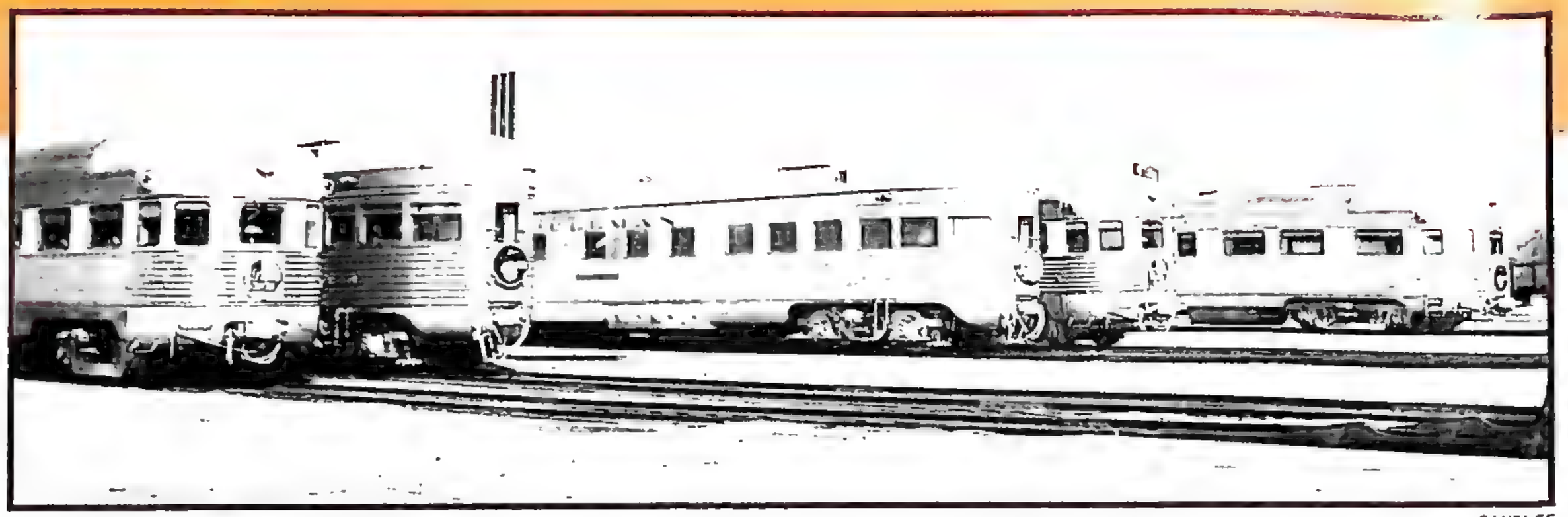
LUXURY INTERIORS WITH NATIVE AMERICAN FLAVOR

The lightweight *Super Chief* was the epitome of luxurious design and service. The car names, chosen by Roger W. Birdseye, Santa Fe's general advertising manager, honored Pueblo villages or Native American tribes: *Isleta*, *Taos*, *Acoma*, *Cochiti*, *Oraibi*, *Laguna*, and *Navajo*. The cars' interior decoration, by designer Sterling B. McDonald, was inspired by the Native American culture of the land through which the train passed.

The two 8-section cars, *Isleta* and *Taos*, had rugs and window drapes of Native American design. Each open section achieved a semblance of privacy by the use of floor-to-ceiling aisle panels partially enclosing the seats. Upper berths in the sections were equipped with small double windows.

A striking interior feature was the rare and valuable wood paneling, in each room of *Oraibi* and *Laguna*, the two 6-bedroom, 2-compartment, 2-drawing room cars. Each sleeping area was treated with a different Flexwood veneer: bubinga, white harewood, avodire, macassar ebony, prima vera, zebrawood, Brazilian rosewood, ebonized maple, American holly, redwood burl, teak, aspen, and satinwood. Each room was finished in a different pattern, which made them pleasant, attractive, and unique.

Bar lounge-dormitory 1370 *Acoma*,



SANTA FE

The 1937 *Super Chief* was the first in an illustrious line of Santa Fe streamliners. At a February 1938 photo session in Chicago, observation cars marked for the *El Capitan*, *Super Chief*, *Chief*, *Super Chief*, and *El Capitan* form an impressive lineup. Today, the *Super*'s *Navajo* (far right) rests at the Colorado Railroad Museum.

featuring zebrawood veneer, had a typical sand painting of Navajo design in the panel behind the full-service bar. The dormitory section was designed to accommodate the 12-man dining-car crew.

The dining car, *Cochiti*, finished with walls of bubinga wood, featured silver service and the later-famous Mimbreno china pattern, both designed by artist Mary E. Coulter. The diner, staffed and operated by the longtime Santa Fe commissary partner firm of Fred Harvey, served the finest cuisine, upholding the tradition that began in Harvey-operated Santa Fe dining cars in 1888 and dated to 1876 in station dining rooms all along the system.

Observation lounge-sleeper *Navajo* did not feature wood veneer in the lounge section but had characteristic Native American decoration in the colors of the rugs and drapes. The furniture coverings were genuine Navajo blankets, yielding an atmosphere of genuine Native American and Southwestern decorative art.

Not to be overlooked was the abundance of space for passengers on this extra-fare train. Designed by Budd architects at the direction of the railway, the passenger areas were larger than standard, with a semblance of privacy even in the open-section cars. Berths were larger, and compartments, bedrooms, and drawing rooms were designed for maximum comfort and convenience. All this attention to detail was augmented by the quiet and smooth ride, notable for the absence of side sway or slack action.

Additional lightweight cars, ordered by Bledsoe in 1937 and delivered in '38, included 30 Budd chair cars that introduced air-conditioned service to the coach-and-tourist Pullman consist of the economy-class *Scout*. This purchase also allowed the introduction of the new all-coach, extra-fare *El Capitan*. Ten more lightweight diners, six club-lounge cars, and six club-baggage cars from Budd, plus 45 lightweight sleepers from Pullman, allowed the daily *Chief* to be fully streamlined. The 45 sleepers built by Pullman were of improved design, based on the experimental car *Forward*, each containing new features and more room. Included in this order were new roomette cars with 18 individually enclosed rooms, each for use by one passenger in complete privacy, with a fold-down berth, washstand, toilet, and wardrobe.

Samuel T. Bledsoe died unexpectedly in 1939. In six dynamic years, he had presided over the modernization of Santa Fe's steam locomotives, the introduction of diesel power, and the creation of a first-class, high-speed passenger service that would serve as a model for the entire railroad industry. Bledsoe's foresight, coupled with his daring expenditure of scarce Depression-era dollars, left a legacy lasting far into the future of the Santa Fe.

SUCCESS BEYOND FONDEST HOPES

Once in service, the streamlined *Super Chief* enjoyed a success beyond the designers' or Bledsoe's fondest hopes. Seldom operated at less than maximum booking, the train became a favorite of show-business notables, in Hollywood and elsewhere.

The acquisition of more E1 diesels (Santa Fe wound up with eight E1A's and three E1B's, all delivered by April 1938) and lightweight cars allowed expansion of *Super Chief* service to twice weekly in early 1938, accompanied by the twice-weekly, all-coach streamliner *El Capitan*.

Throughout their lives until the inception of Amtrak, the *"Super"* and *"El Cap"* operated on the same 39¾-hour schedule. In 1946, the two trains increased their frequency to every other day, and went daily in 1948. Although many of the subsequent cars came from Pullman and American Car & Foundry, the luxury and service standards first established on the first Budd train was never compromised while under Santa Fe operation.

The *Super*'s daily schedule as a separate train lasted for only 10 years, though, as a decline in patronage and an increase in operating costs forced change. In January 1958, the *Super* and *El Cap* began operating as a combined consist, with occasional exceptions during peak traffic periods such as in summer and around wintertime holidays. The combined train held on until 1971, when after 36 years of *Super Chief* operation Santa Fe reluctantly gave up direct operation of passenger trains to Amtrak.

The new national passenger carrier retained the train name *Super Chief*, but when service began to deteriorate Santa Fe management withdrew permission for Amtrak to continue using the famous title. The Chicago-L.A. train became the *Southwest Limited*, later modified to *Southwest Chief*. Although the *Super Chief* name disappeared from the timetable, it remains in memory as the shining example of passenger railroading at the peak of perfection. ■

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Streamliner

SNAPSHOTS

1 of 2

SP's beautiful train

TWO PHOTOS, LINN H. WESTCOTT

CALIFORNIA'S TRAIN: Many great trains went *to* the Golden State, but Southern Pacific's Los Angeles–San Francisco *Daylight* was California's own. Launched in 1922, the *Daylight* was stunningly re-equipped as a streamliner in March 1937, with big Lima 4-8-4's and a mix of articulated and single-unit cars from Pullman-Standard. Livery alone would have earned the train a place in history, but it was also hugely successful, spawning a fleet of *Daylights*. Above: Train 99 leaves Santa Barbara. Right: People board 1939 cars, which had unique luggage elevators beside the doors. Far right: GS-3 4420 rolls 99 near San Miguel in '41.

DAN POPE COLLECTION

Going public

Some roads were slow to order streamlined trains, and others had little money to advertise them, so suppliers took their case directly to the people

BY **MICHAEL ZEGA** ILLUSTRATIONS FROM THE AUTHOR'S COLLECTION

Bold, colorful ads with E6 diesels touted General Motors' status as the "biggest builder of locomotives in the world." Westinghouse featured a new PRR GG1 in an ad marking the supplier's 50th anniversary.

ALTHOUGH FEW IN NUMBER, advertisements promoting the early streamliners offer a matchless record of the new trains' revolutionary designs. Among the most vivid and widely circulated were those produced for consumer-products companies, train builders, and railroad equipment suppliers. The roll reads like a list of the nation's industrial giants—companies such as R. J. Reynolds Tobacco, Ford Motor Co., General Motors, Alcoa, and Westinghouse. While the story of the railroads' advertising and promotion work is well documented, the contribution of this broad range of firms remains largely unacknowledged.

The collaboration of carrier, builder, and supplier that produced the first streamliners marked a new, innovative outlook. Their application of emerging railcar construction and propulsion technology as a means to pull the industry out of its dire economic straits represented a substantial wager. And the wager was only compounded by the fact that the Depression's losses left few extra dollars for much-needed advertising and promotional support.

Fortunately for railroad budgets, the immense and immediate nationwide enthusiasm for streamliners greatly reduced the need for advertising. Indeed, the new trains' popular reception set a pattern that produced a fortuitous synergy. Seeing little need to advertise services that were already sold out, railroaders instead concentrated on the less visible but equally tangible im-

The Pennsylvania Railroad's latest electrification project links New York with the Nation's Capital... makes possible operating economies and faster, more comfortable service.

WINGS FOR THE IRON HORSE

The Pennsylvania Railroad's new electric highway from New York to Washington opens another stirring chapter in the annals of transportation. Heretofore railroad electrification was primarily devoted to the improvement of terminal and main line suburban service, to tunnel operations, and the hauling of heavy freight over steep mountain grades. Today it becomes the new order of railroad modernization on major trunk lines . . . represents a definite advance in the economical readjustment of railroad facilities to the demands of modern travel.

In this advance, Westinghouse has played a major role, consistent with a lifelong tradition of co-operation with the Transportation Industry.

The Westinghouse Electric and Manufacturing Company was reared on that tradition. Its founder invented and brought to brilliant fruition the Westinghouse Air Brake. Its first great achievement was the successful promulgation of the alternating current system . . . upon which is based the Pennsylvania's system for main line electrification.

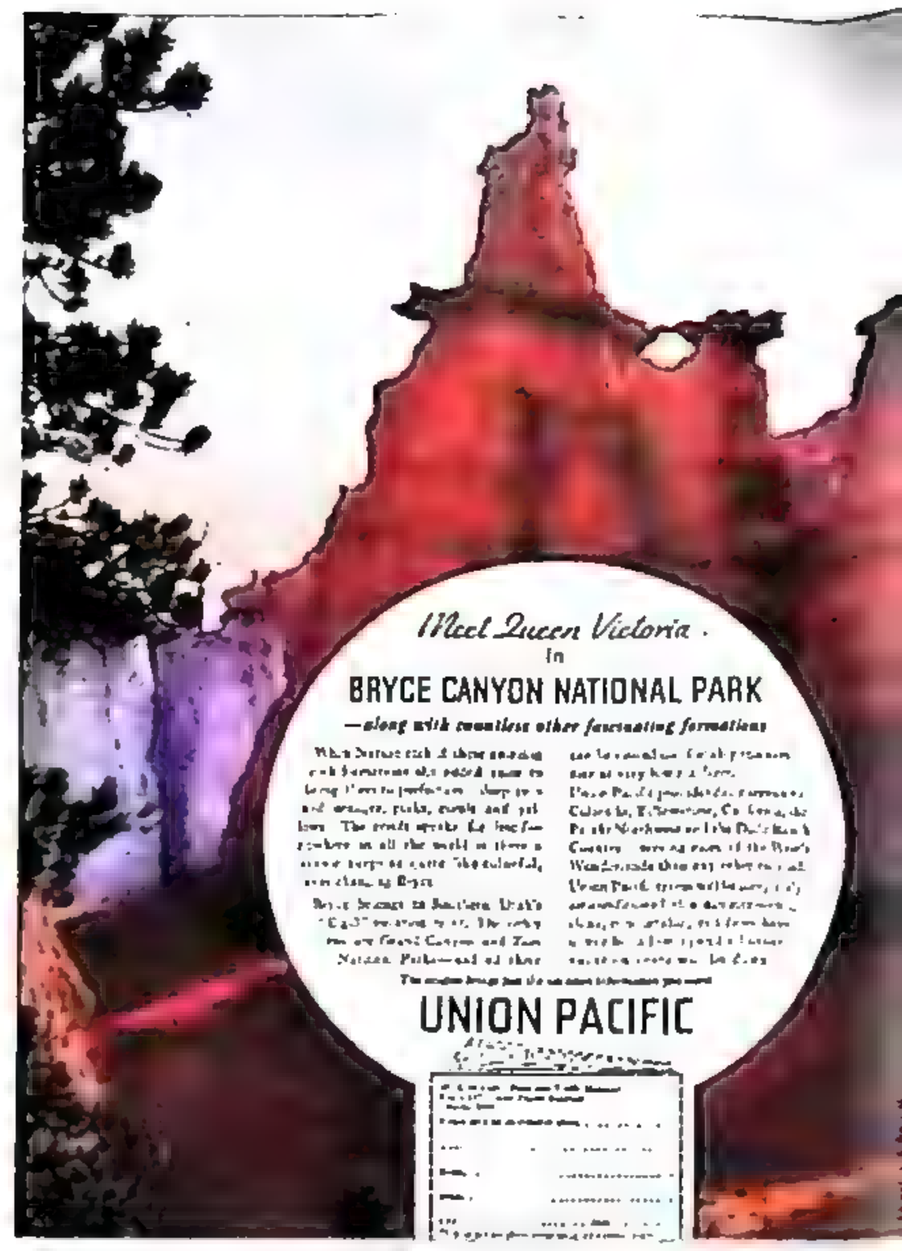
To this great project, Westinghouse brought the wealth of a half-century of experience and engineering progress. A conspicuous example of Westinghouse enterprise on every front where electricity is helping to build a new and better economic civilization. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

WESTINGHOUSE 1886 1936 GOLDEN JUBILEE

50 YEARS OF
GROWTH AND ACHIEVEMENT

STREAMLINED
UNDOUBTEDLY--
Where conditions are favorable, the light weight streamlined train is going to come into the railroad picture.
but
Is it fair to yourselves or your stockholders to condemn the steam locomotive in general on the basis of what you are doing now with an obsolete main line locomotive far too heavy and costly in operation and maintenance for the service in which it is operating? If you have a sum of money to spend to improve a certain service, why not find out what the steam locomotive designer has to offer?
You might be surprised at the money you can save.
AMERICAN LOCOMOTIVE COMPANY
We are prepared to submit streamlined designs, steam or diesel powered as desired, to meet any or every demand of our railroads.
60 CHURCH STREET NEW YORK N.Y.

An Alco ad with artwork by industrial designer Otto Kuhler won notice for its forceful defense of steam power. Reflecting the railroad's view that streamliners would sell themselves, a UP ad emphasized Bryce Canyon, and had only a small drawing of a motor train.



provements in coach travel, as embodied in trains such as Union Pacific's *Challenger*.

The few streamliner promotions that the railroads did run provided basic information in small-space newspaper and magazine ads—fares, schedules, and "sailing" days—much as in the years of railroading's (and advertising's) beginnings. Supplementary promotional items were typically inexpensive to produce and readily distributed via the railroads' own network. Most memorable were posters and booklets selling the likes of the *Mercury*, *Super Chief*, and *Daylight*.

By comparison, the work of the consumer-products companies, builders, and suppliers evidenced a more direct and aggressive strategy. That it proved effective attests to the powerful public impact registered by the first of the new trains. Although American industry streamlined a broad range of consumer products (*e.g.*, autos, kitchen appliances, and furniture), streamlining's railroad applications attracted a particularly intense public attention. As a result, consumer firms sought to associate their products with this latest popular phenomenon, hoping that the streamliner images would enhance their products' standing and sales. The builders' and suppliers' objective was equally straightforward: They sought to increase sales of new equipment by motivating the end users—railroad passengers—to express their preferences to rail management.

The firms sought to reach a broad national audience by placing their ads in mass-circulation magazines while maximizing visibility through the use of color reproduction. Most often their ads ran in *The Saturday Evening Post* and *Collier's*, a luxury the carriers could not afford. However, as earnings began to rebound in 1936 and '37, a few roads were able to resume advertising in national magazines. Still, those that did seldom managed to budget the additional expense for color ads.

KUHLER'S DEFENSE OF STEAM

We begin with an anomaly, run only in the railroad trade press, but important for its artist and image. Otto Kuhler's ad for the American Locomotive Co. [above left] appeared in *Railway Age* in February 1934 within days of the well-publicized unveiling Union Pacific's M-10000 motor train. *Advertising Age* cited the Alco ad's resolutely pro-steam message under the heading "Defense: 'Copy does not allow its [product] to be forgotten in all the excitement."

Designer Kuhler's artwork—a futuristic

AS THE BURLINGTON'S "ZEPHYR" dashed from Denver to Chicago, Jack Ford's steady hand was on the throttle. Below he tells what the long nonstop trip felt like, and what Camels meant to him after it was over.

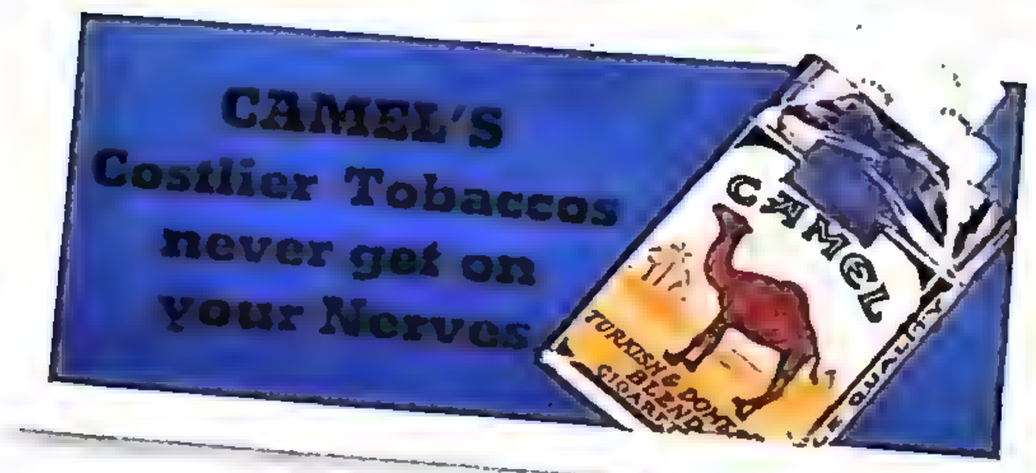
A PLEASURE that drives away fatigue and listlessness!

Jack Ford, crack engineer of the Burlington on the "Zephyr's" amazing "dawn-to-dusk" dash, says:

"When the 'Zephyr' rolled to a stop in front of the 'Wings of a Century' stage at the Chicago Fair, I'd been through a lot of excitement and strain...felt pretty much used up. But a Camel quickly gave me a 'lift' and I felt O. K. Most railroad engineers prefer Camels. They can smoke Camels a lot without affecting the nerves. Camels also increase their energy when they feel worn out. I've smoked a lot of Camels in my time, and that goes for me—all the way."

Everyone is subject to strain—whether physical, mental, or emotional. So it's important to know that Camels do release your stored-up energy...Helene Madison, Olympic swimmer; Carl Hubbell, ace pitcher; and Gene Sarazen, golf champion, all add the weight of their experiences to the suggestion, "Get a lift with a Camel." And the findings of a famous scientific laboratory confirm what they say about Camel's "energizing effect."

So begin today to enjoy Camels. Enjoy their delightful "lift." Enjoy their rich, good taste. Enjoy them *often*! For Camel's costlier tobaccos never affect the nerves.



Camels are made from finer, MORE EXPENSIVE TOBACCOS—Turkish and Domestic—than any other popular brand.

"Get a LIFT with a Camel!"

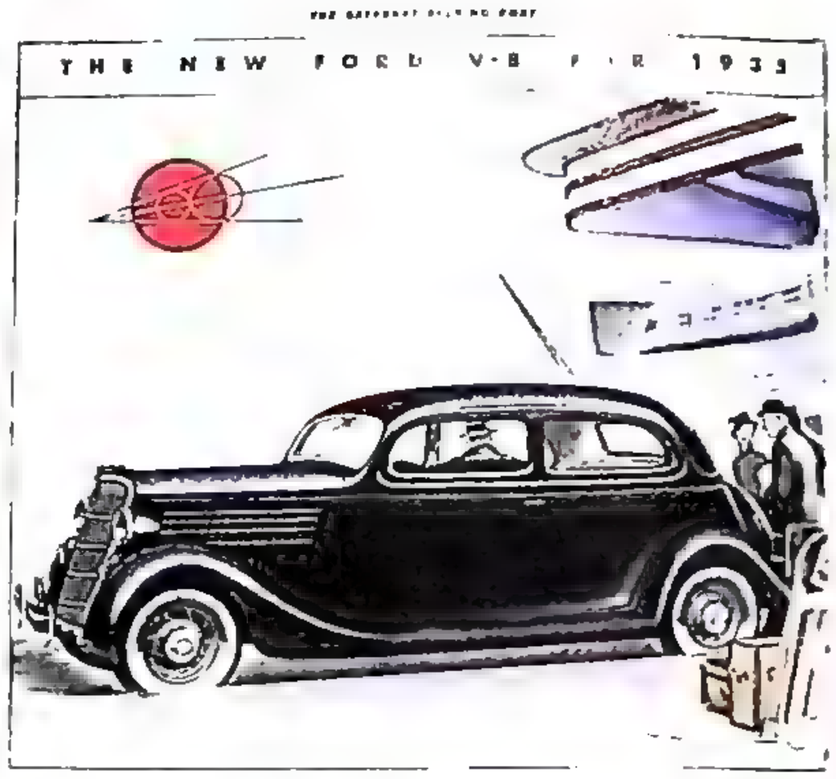
Copyright, 1934, R. J. Reynolds Tobacco Company

black-and-white wash so simple it neared abstraction—depicted a fleet of streamlined steam trains. His illustration made knowledgeable use of steam's attributes, choosing to emphasize varied patterns of locomotive smoke and light and shadow, thereby giving each locomotive a personality of its own—a characteristic the diesel had lost to uniformity. Kuhler also borrowed from the diesel-train designs, choosing to render steam locomotive and cars as an integrated unit.

Pioneer streamliner operator Union Pacific waited fully a year to include its new train in a national advertising program (February-March 1935). Even then, images of the little train were modest—small line drawings set at the tail of larger ads. An early example showed a streamliner illustration at the bottom of a summer-season color halftone that advertised the Queen Victoria rock formation at Bryce Canyon National Park [opposite page]. In another, a Deco-styled *Los Angeles Limited* column of February 1935 ended with the exhortation, "Ask for descriptive literature of

Consumer-products companies sought to cash in on the the streamliners' immense popularity by linking their wares with the new trains. The *Zephyr*'s engineer smoked a Camel, so you should too!

THE WORLD'S FASTEST TRAIN! It raced across the continent in 56 hours 55 minutes. It attained a top speed of 120 miles an hour. But these new speed records were made by the Union Pacific "M-10001"—powered by Winchester, Wisconsin Diesel-Hydraulic engine of General Motors design. It traveled 3,334 miles at a fuel cost of but $50
"AN EYE TO THE FUTURE—AN EAR TO THE GROUND"



General Motors and Ford featured streamliners in ads for that ultimate consumer product: the automobile. A GM division powered UP's M-10001, but Ford's inclusion of a *Zephyr*-like train was just for effect.

Union Pacific's 6-car Streamliner."

The rationale for UP's behavior was found in the *Challenger*, an economy coach train introduced in summer 1935. Formed of standard cars, it offered many times the fixed-consist streamliners' money-making potential. Chicago & North Western passenger traffic manager R. Thompson said it best in a May 23, 1936, note to UP's W. S. Basinger: "The streamliner is a train that will advertise itself to a large extent . . . we could carry on four trips of the *Challenger* as much business as we handle on all the sailings in one month of the streamliner." A year and a half later, *Business Week* affirmed their strategy in reporting on Southern Pacific's new Los Angeles-San Francisco *Daylight*, which it pronounced an "Ad on Wheels."

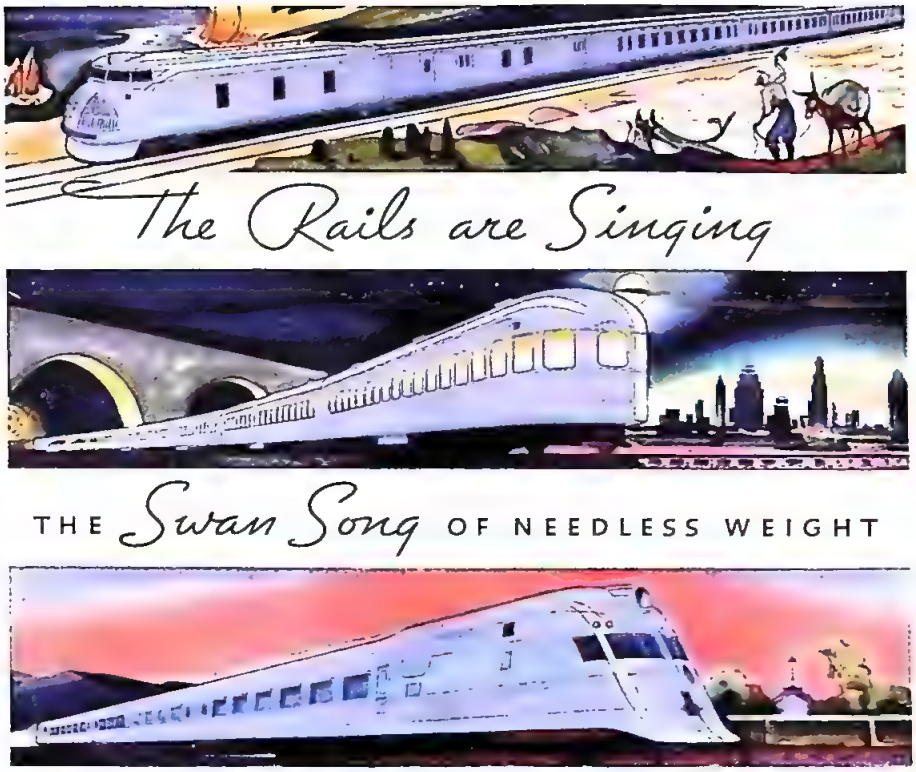
The first color pictures of the Burlington's *Zephyr* to be published in national mass media appeared in a Camel cigarette ad [preceding page]. A color halftone photograph featured CB&Q engineer Jack Ford, evidently a man of great restraint, who waited the run's full 13 hours before lighting up a Camel for a "lift."

Surprisingly (given that the *Zephyr*'s engine-maker was a General Motors subsidiary), the Ford Motor Co. also produced an early rendering of the *Zephyr*, in March 1935. Here the train and a futuristic structure fill in the background of an ad for the similarly styled 1935 Ford V-8 [above]. The *Zephyr*'s presence, though, was likely due as much to business acumen as national popularity—just two months earlier, Ford's ad agency, N. W. Ayer, had announced its stewardship of the first-ever national advertising campaign for the Edward G. Bud Manufacturing Co., the *Zephyr*'s builder. Artist James W. Williamson, who specialized in automobile illustration, was virtually the Ford staff artist.

Soon thereafter, GM featured a vivid photograph of the arrival of UP's M-10001 at New York's Grand Central Terminal upon completion of its record-setting transcontinental journey [above left]. It provided readers a crisp firsthand view of the train that had dominated newspapers and newsreels (albeit in rather grainy images) for nearly a week.

SILVER INK AND BLACK & WHITE

From its introduction in 1930, the Aluminum Company of America's campaign employed a uniquely effective attention-getting strategy. Alcoa's ads were printed with silver-colored ink, giving the page a metallic gleam. The silver finish was meant to indicate the presence of Duralumin, the firm's lightweight alloy of copper and aluminum. A September 1935 ad featured three aluminum trains, UP's M-10001, Baltimore & Ohio's *Royal Blue*, and Gulf, Mo-



bile & Northern's *Rebel*, each of which sported its own distinctive paint scheme in revenue service [right].

Westinghouse celebrated its 50th anniversary with a campaign that featured important industrial events. In spring 1936 the firm commemorated its long association with transportation innovation by recognizing Pennsylvania Railroad's completion of electrification to Washington, D.C. [page 33]. Coincidentally, just two months later, *New Yorker* magazine writer Morris Markey had climbed aboard the cab of Pennsy GG1 4807 for a ride. He described "an immense black box, filled with machinery, its black exterior as sleek and hard as the back of a beetle," an apt metaphor for Raymond Loewy's seamless new design.

Last to appear, and arguably most spectacular, was a campaign for General Motors locomotives, beginning in August 1941. GM employed brilliant color illustration and photography to emphasize the bold styling and color schemes of its diesels. The effort coincided with a singular accomplishment for the new technology: the rise of GM's Electro-Motive plant in La Grange, Ill., to "the biggest builder of locomotives in the world."

GM featured leading illustrators, here Australian-born Melbourne Brindle [page 32], known for his use of rich colors. The campaign also coincided with the reorganization of creative arrangements in advertising's system of organization. It marked the ascendancy of the position of art director, who set the creative theme for campaigns, which had expanded beyond the practical output of any single individual; now a creative team hired individual artists to create each advertisement.

Alcoa's effort offers an interesting contrast to the Budd Company's campaign. Ever strapped for cash, Budd rendered its shining silver trains in austere black-and-white [above left]. Color illustration would not be introduced until the assurance of an influx of postwar orders in 1944 prompted the hiring of artist Leslie Ragan.

Ultimately, many more companies came to draw upon the streamliners' appeal in their advertising. Gulf Refining featured New Haven's *Comet*; Kimberly-Clark Paper, the first streamlined steam locomotive, New York Central 4-6-4 5344 *Commodore Vanderbilt*; and Crane's papers and Pennzoil, UP's M-10001 and *City of Los Angeles*. Then, all too soon, war and its restrictions brought streamliner construction —and promotion—to an abrupt halt.

World War II's demands took their toll on the novel trains and, likewise, their contemporaries, the trans-Atlantic liners. Unfortunately, the trains of the postwar era never fully regained the combination of anticipation and sensation that marked the advent of the first streamliners. ■

Silver ink gave an Alcoa ad an arresting appearance while suggesting the new material of Duralumin. Cash-poor Budd achieved striking ads using inexpensive black-and-white.

Winton

From autos to railroading, via yachts and the Navy

How Electro-Motive's original power supplier helped propel General Motors into the diesel business

BY **CARL R. BYRON**

BERNARD GOLIAS COLLECTION

Alexander Winton is seen in front of his factory at the wheel of a 1913 Winton touring car.

IT IS IRONICALLY APPROPRIATE that Electro-Motive Division, a giant in railroad motive-power production for more than half a century but a relative flyspeck on General Motors' corporate organization chart, traces a key part of its history to the automobile. From 1936 to 1986, EMD (it was the Electro-Motive Corp. until January 1, 1941) produced the majority of diesel locomotives sold in North America. In the "classic era" from the 1940's through the '70's, EMD's market share regularly approached, and occasionally exceeded, 80 percent. Though no longer dominant, EMD remains a major locomotive supplier.

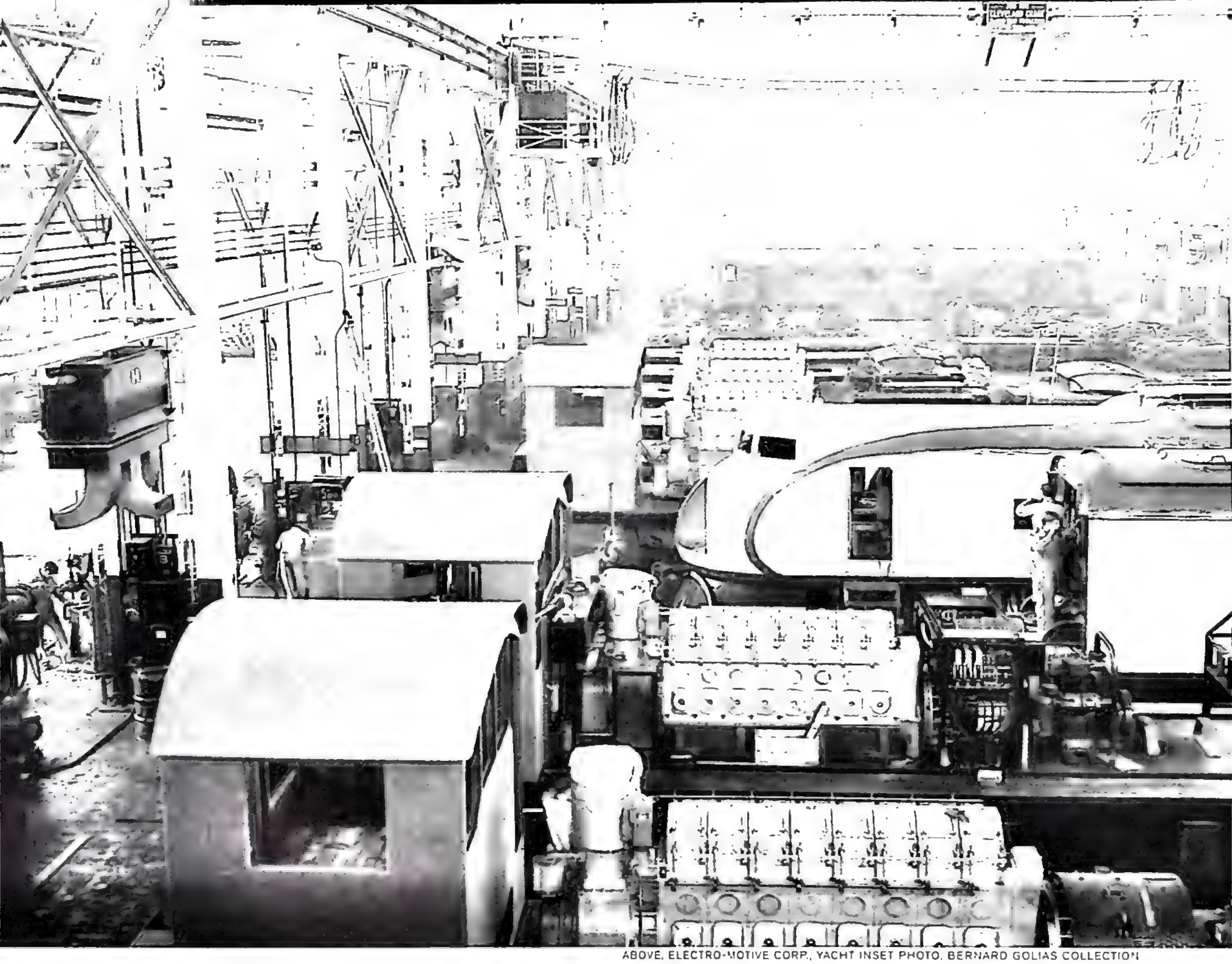
This was all in the unseen future when Harold Hamilton and Paul Turner founded the Electro-Motive Engineering Co. in Cleveland, Ohio, on August 31, 1922. Their firm was just another struggling small business, and it needed an engine supplier to propel, figuratively and literally, sales of its gas-electric, self-propelled railroad motor cars (later known by numerous nicknames, among them "doodlebugs"). Across town was the Winton Engine Co., established in 1912 and a reputable manufacturer of marine and stationary engines.

Harold Hamilton called on Winton.

Company founder and owner Alexander Winton, born in Scotland on June 20, 1860 had emigrated to the U.S. in 1879, and by 1892 he was operating a successful bicycle manufacturing company in Cleveland just as bicycling emerged as a national craze. He was an astute businessman and an inveterate tinkerer, and as the bike business boomed, he turned his talents to developing an automobile.

In October 1896 he completed his first car, and on March 15, 1897, the Winton Motor Carriage Co. was incorporated. Late that year, in a calculated effort to promote his new vehicles, Winton became the first motorist to drive from Cleveland to New York City over the crude roads of the day. He gathered some press coverage and repeated the stunt to wider acclaim in 1899.

His firm again gained national attention in 1903 when Horatio Nelson Jackson, a 3



ABOVE, ELECTRO-MOTIVE CORP., YACHT INSET PHOTO, BERNARD GOLIAS COLLECTION

year-old Vermont physician, drove a Winton automobile from San Francisco to New York. He and his traveling companion/mechanic, Sewall K. Crocker, entered the history books as the first people to complete a U.S. transcontinental auto trip.

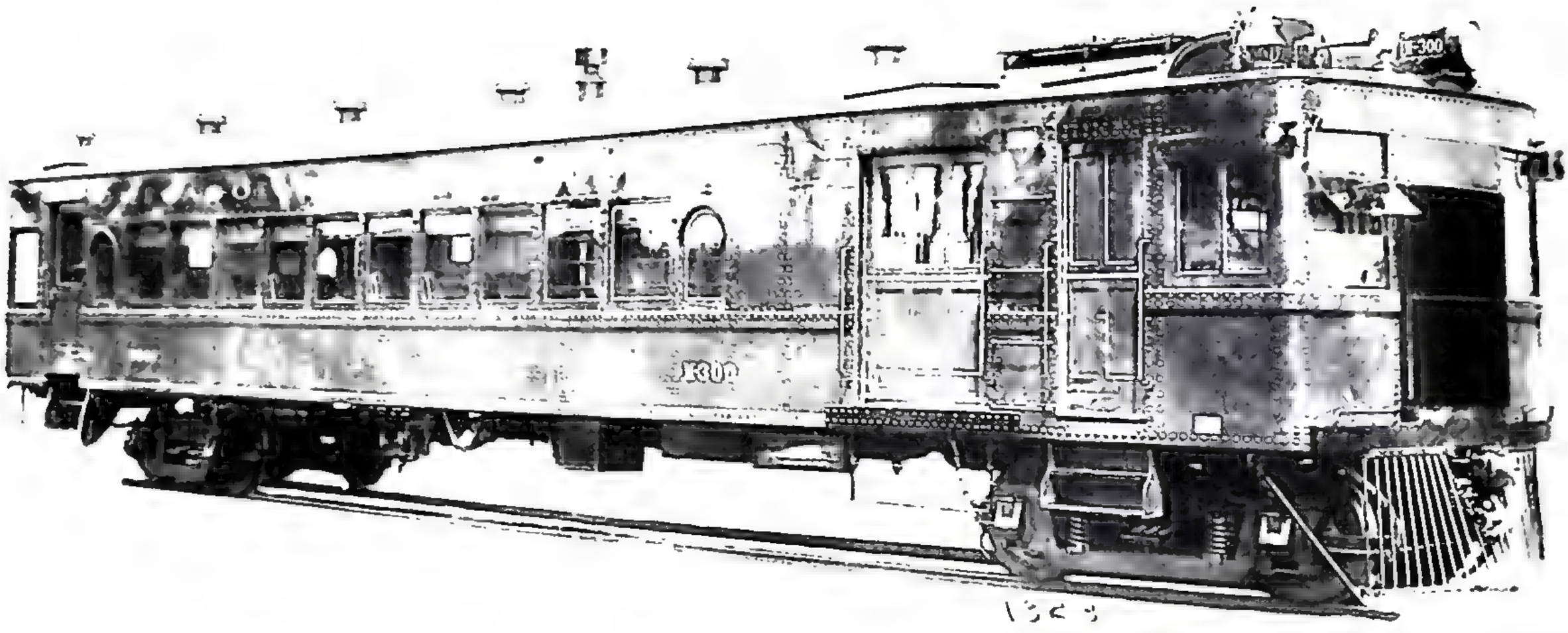
Winton motor cars were hand-crafted, expensive, and marketed to the "carriage trade." When Alexander Winton raced Henry Ford in 1901, though, Ford won. It was sweet revenge for Ford, as Winton had earlier refused to hire him, and a harbinger of both men's fortunes in the auto business. More important, of course, Winton, Ford, and others were setting the stage for the revolution that would ultimately render obsolete many of the rail-borne vehicles Winton would help power.

The Winton Motor Carriage Co. prospered during the "Gilded Age," but the post-World War I recession of 1921-22 hit the company hard, and in February 1924 Winton ceased automobile production. His Winton Engine Co., however, continued to produce gasoline and diesel engines.

Winton Engine made its initial sale to the Electro-Motive Co. in 1924 (Electro-Motive had dropped "Engineering" from its name the year before). EMC's first two demonstrator gas-electric cars were each fitted with a Model 106, 6-cylinder inline 175 h.p. gasoline engine, designed by Winton Chief Engineer Carl Salisbury specifically to Electro-Motive's requirements. (Harold Hamilton had specified individual replaceable cylinder heads and sleeves; a heavy-duty crankshaft with oversized bearings; a crankcase with multiple access covers for easy inspection and maintenance; and maximum rpm's of 750 to 1000.)

EMC sold its first car to the Chicago Great Western (which numbered it M-300) in August 1924, and before year's end the second demonstration car joined Northern Pacific's roster (as NP B-3). In the 12 months following the sale of M-300, EMC received orders for 25 more gas-electrics and placed orders with Winton for a like number of engines. Both Winton and EMC now were in the railroad market.

Winton diesels for rail and sea: Several switchers, a *City of Portland* power unit, and Baltimore & Ohio box-cab No. 50 occupy EMC's shop floor at La Grange, Ill., in 1936 (above). Charles Kettering's 170-foot yacht *Olive K.* of 1929 (opposite page), with two 600 h.p. Wintons, was the GM v.p.'s second waterborne test lab.



ELECTRO-MOTIVE CO=

Electro-Motive founder Harold L. Hamilton (at right in photo at right) was a General Motors v.p. when he greeted "Boss Ket" Kettering, formerly head of GM research, in front of *Zephyr* 9900 at its 25th anniversary fete at La Grange. EMC's first gas-electric car was Chicago Great Western M-300 (top), delivered in August 1924. The agrarian CGW was a railcar pioneer, buying four McKeens in 1910 and eventually owning 21 various motors and trailers. "Top of the line" were four Pullman-EMC's of 1932, the last of which, 1009, is on the final lap to Chicago's Grand Central Station (right) as it rolls under the Belt Railway of Chicago in August 1949 with the local from Oelwein, Iowa. The 1009 lasted until 1953; M-300 burned in 1930.

ELECTRO-MOTIVE

EDWARD JANOS•

GROWING CLOSE TO EMC

Never satisfied with the status quo, Winton in 1925 enlarged the Model 106's cylinder bore and designated the engine Model 106A. It produced 200 h.p. at 1000 rpm and subsequently was up-rated to 220 h.p. at 1050 rpm. Concurrently, Winton developed for EMC the Model 120 engine that produced 275 h.p. In 1927, Winton upped the 6-cylinder Model 120 to 300 h.p. and introduced an 8-cylinder, 400 h.p. version, both for railcar use. The power plants became Winton Models 146 and 148, respectively.

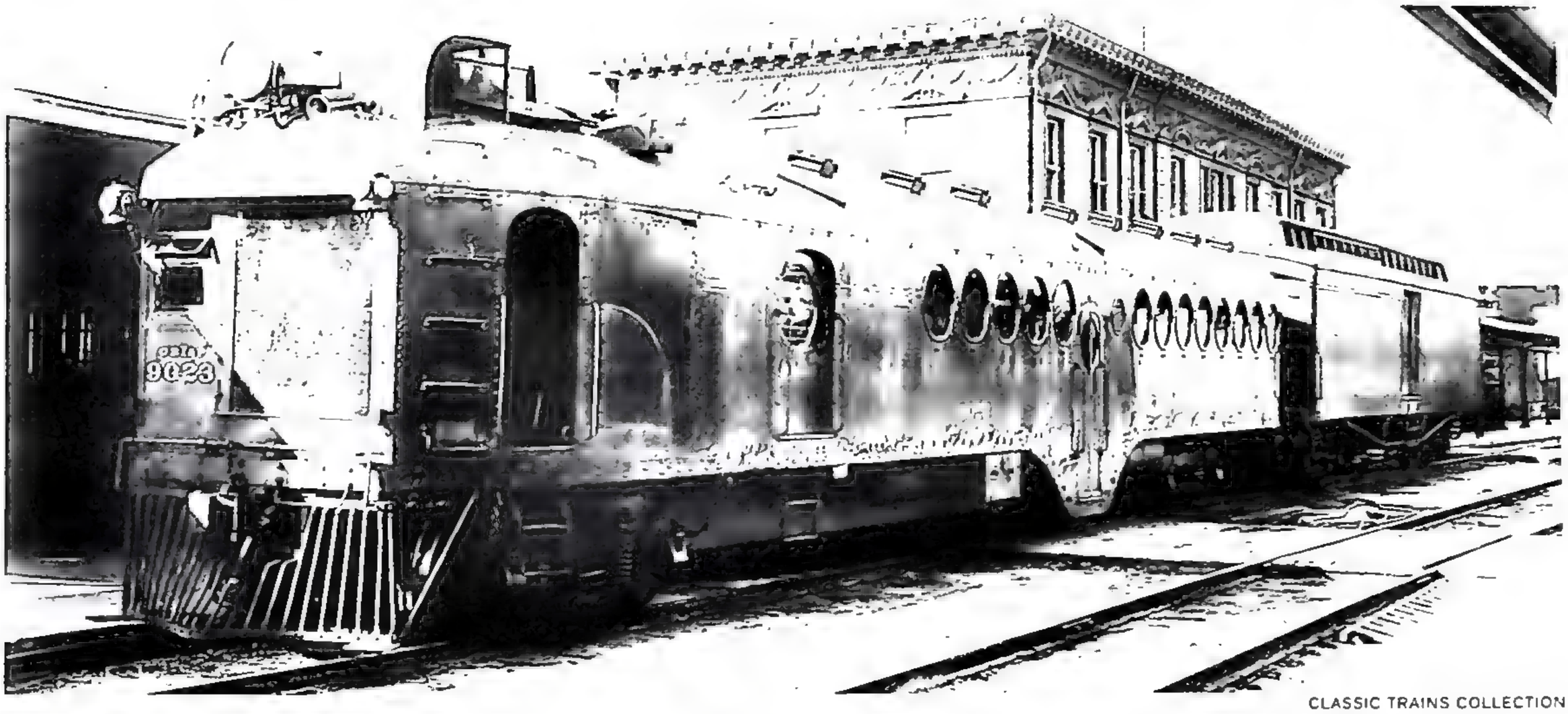
Winton supplied 36 engines to EMC in 1925 and 45 more the following year. Gas-electric car orders peaked at 105 engines delivered in 1928, and by 1930, Winton had powered more than 400 of EMC's gas-electrics, about 84 percent of the 1920's "doodlebug" market. Winton and Electro-Motive's relationship grew so close that EMC's offices were in the Winton factory and its first parts depot was next door.

In addition to supplying the gas-electric cars' prime movers, Winton by 1925 began delivering engines directly to railroad shops and carbuilders for installation under EMC supervision. Chicago Great Western, Rock Island, Union Pacific, and other roads repowered old McKeen gas-mechanical passenger cars that had become too unreliable to use but were too new to scrap. A 200 or 300 h.p. Winton gasoline prime mover, plus General Electric electrical equipment, soon had the cars performing reliably.

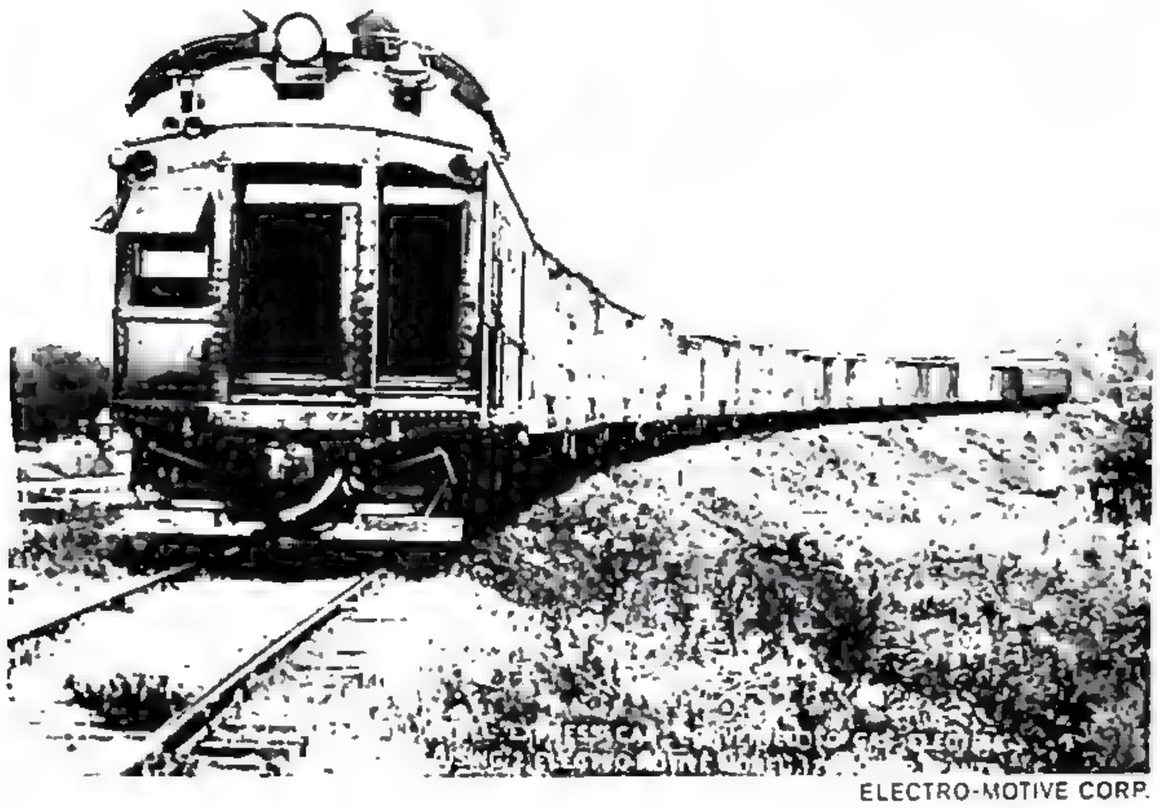
Rock Island was so pleased with its McKeen car results that in 1927 it stripped two steel baggage cars and, with EMC's guidance, installed twin 275 h.p. Winton Model 120 engines in each, creating the first so-called "baggage-car locomotives." In May 1929 Rock Island did three more in-house, but with twin 400 h.p. Model 148 engines, then ordered seven others new from EMC/St. Louis Car. Several would last—repowered with Hamilto or Caterpillar engines—until 1964, bu when they arrived in November 1929, so had the Great Depression.

GASOLINE VS. DISTILLATE

George Codrington, Winton's presi dent, faced two substantial problems in early 1929. (Codrington had been hired by Alexander Winton in 1915 to captain his yacht *La Belle* on Lake Er and in off-hours to be his chauffeur. I 1917 Codrington joined Winton Engine as superintendent, and rose to b come president in 1928.) One was th price of gasoline, which had risen to the point where the cost savings between a steam-powered passenger tr



CLASSIC TRAINS COLLECTION



ELECTRO-MOTIVE CORP.

ROCK ISLAND

Rock Island, pleased with the re-engining of McKeen gas-electric cars, embarked on a unique "baggage-car motor" program. Redone McKeen 9023 (top, at Little Rock, Ark.) lost its knife-nose front end. The first of five conversions from 40-foot steel express cars, done at RI's Horton, Kans., shop in 1927, was 9001 (left), which boasted two 225 h.p. EMC power plants. Unit 9012 (above), one of seven built new for RI by St. Louis Car in 1929, would be re-engined with Caterpillar diesels in 1950.

and a self-propelled, gasoline-powered doodlebug had disappeared, depressing EMC gas-electric-car sales. The other problem was the prohibitive cost to develop a prime mover that could utilize 3-cents-a-gallon distillate fuel instead of 15-cents-a-gallon gasoline.

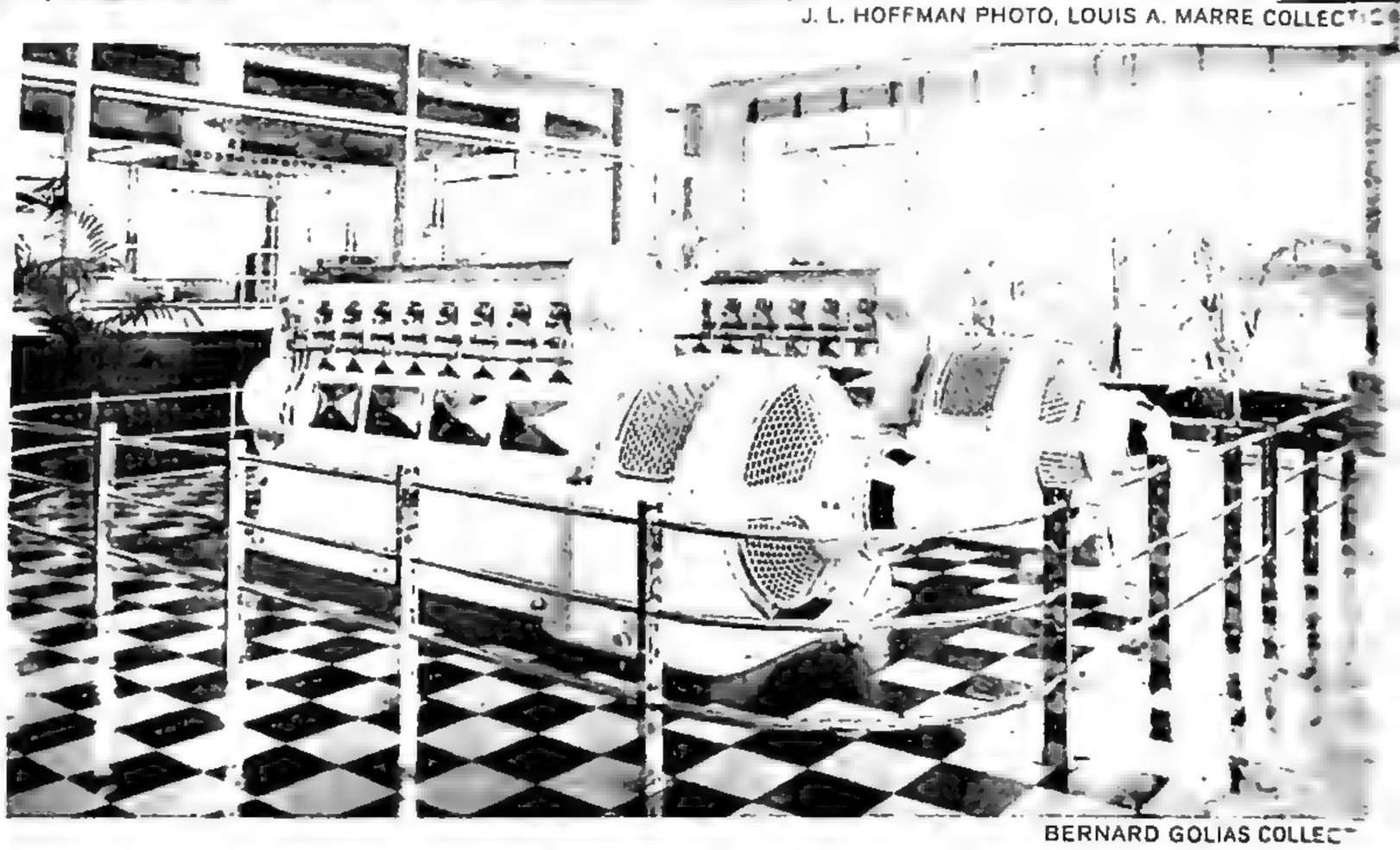
Unknown to Codrington, the resolution to these problems was already developing from two divergent sources, the U.S. Navy and the result of a Winton engine sale the prior year.

Marine applications had been the majority of Winton Engine's business since it introduced a 6-cylinder, 150 h.p. gasoline engine to that market in 1913. Winton followed with a 6-cylinder inline diesel engine in 1918, and in 1919 it pioneered the use of diesel-electric drive in motor yachts. Likely, the gas-electric or diesel-electric marine drives particularly intrigued Harold Hamilton during his initial visit to Winton in 1922, since the success of EMC's gas-electric cars required just such a package. Regardless, Winton's fate was changed by its sale of a marine diesel engine to power the yacht of Charles F. Kettering, a General Motors vice-president and chief of its research laboratory in Detroit.

Kettering, known as "Boss Ket" or just "Ket," was an inventor and engineering genius nearly comparable in stature to Thomas Edison or George Westinghouse. Kettering created the first practical automobile self-starter and electro-mechanical distributor, both essential in converting the automobile from an elitist toy to a mass conveyance. Other big projects included high-octane gasoline, and in concert with Du Pont, numerous chemical products, including Duco and Dulux brand fast-drying enamels and lacquers. Kettering's reputation was such that *Time* magazine placed him on the cover of its January 9, 1933, issue.

In 1926 or '27 Kettering, along with GM President Alfred Sloan Jr. became interested in developing a diesel engine for truck, railroad, and other heavy-duty applications. To this end, in April 1928 Kettering commissioned a 105-foot yacht, named *Olive K.* after his wife, and commenced looking for

J. L. HOFFMAN PHOTO, LOUIS A. MARRE COLLECTION



BERNARD GOLIAS COLLECTION

Winton's last motor-car distillate engine sale was in June 1933, for a Model 191, installed in Frisco 2124. In 1946, six years before it was sold to a short line, the car was parked at Tulsa, Okla. (above), while its pilot was being repaired. Two 201's powered GM's Chevrolet exhibit (right) at Chicago's 1933 Century of Progress fair.

the best diesel engine to power it. Two 175 h.p. Winton marine diesels were purchased and installed, and Ket tinkered with them constantly.

In early 1929, having learned all he could from the *Olive K.*, Kettering ordered a larger replacement yacht with diesel-electric power. Winton's George Codrington promised to build him "the finest diesel engine sold in this country." Kettering's blunt response was, "I am not interested in this [proposal] in the least!"

However, as Kettering developed a relationship with Winton through those first yacht engines, he discovered that the firm had something in which he *was* very interested. Chief Engineer Carl Salisbury was developing—and had a patent application on—a device he called the unit injector, which measured out a specific amount of fuel and injected it into the cylinder under high pressure. The nifty part was that the injector eliminated the previously necessary high-pressure fuel pump and individual fuel lines to each cylinder.

Now, fuel could be circulated at low pressure to each injector, which in turn would meter out an identical volume and place it under high pressure only within the injector body during that cylinder's firing. The problem of unequal fuel supply to various cylinders was eliminated, as was the hazard of a fuel fire owing to leaking high-pressure lines or a pump seal.

On September 5, 1929, the $500,000 second *Olive K.* was christened. The craft was 170 feet long with a 26-foot beam, and nestled below its library and formal dining room were two 600 h.p. Winton 4-stroke diesel engines equipped with Salisbury's unit injectors. Although far from flawless, the engines' performance was substantially improved over the older single fuel pump, so-called "common rail" system used on the first *Olive K.*

Even as the second *Olive K.* was christened, Kettering desired to acquire Winton Engine, and the GM Executive Committee soon concurred. Negotiations were nearly done when the October 1929 stock market crash intervened. Thanks to plunging stock prices—and likely, Winton's tough negotiating stance, knowing it held a valuable patent—it was not until June 20, 1930, that Winton Engine Co. became Winton Engine Corp., a subsidiary of General Motors Corp.

Alexander Winton died on June 21, 1932, just before his firm, under GM auspices, reached its apex of accomplishment. General Motors retained George Codrington, however, and he led Winton through its 1937 GM-orchestrated metamorphosis into GM's Cleveland Engine Division. Codrington became a GM vice-president in 1942, retired on December 31, 1952, and died on April 26, 1961.

WINTON ADDED, EMC NEXT

Aware of the Winton-EMC relationship, Kettering and GM approached the now-struggling railcar builder, and on December 31, 1930, Electro-Mo

PRESTON GEORGE

G. M. BEST, RAILROAD PHOTOGRAPHIC CLUB

BURLINGTON ROUTE

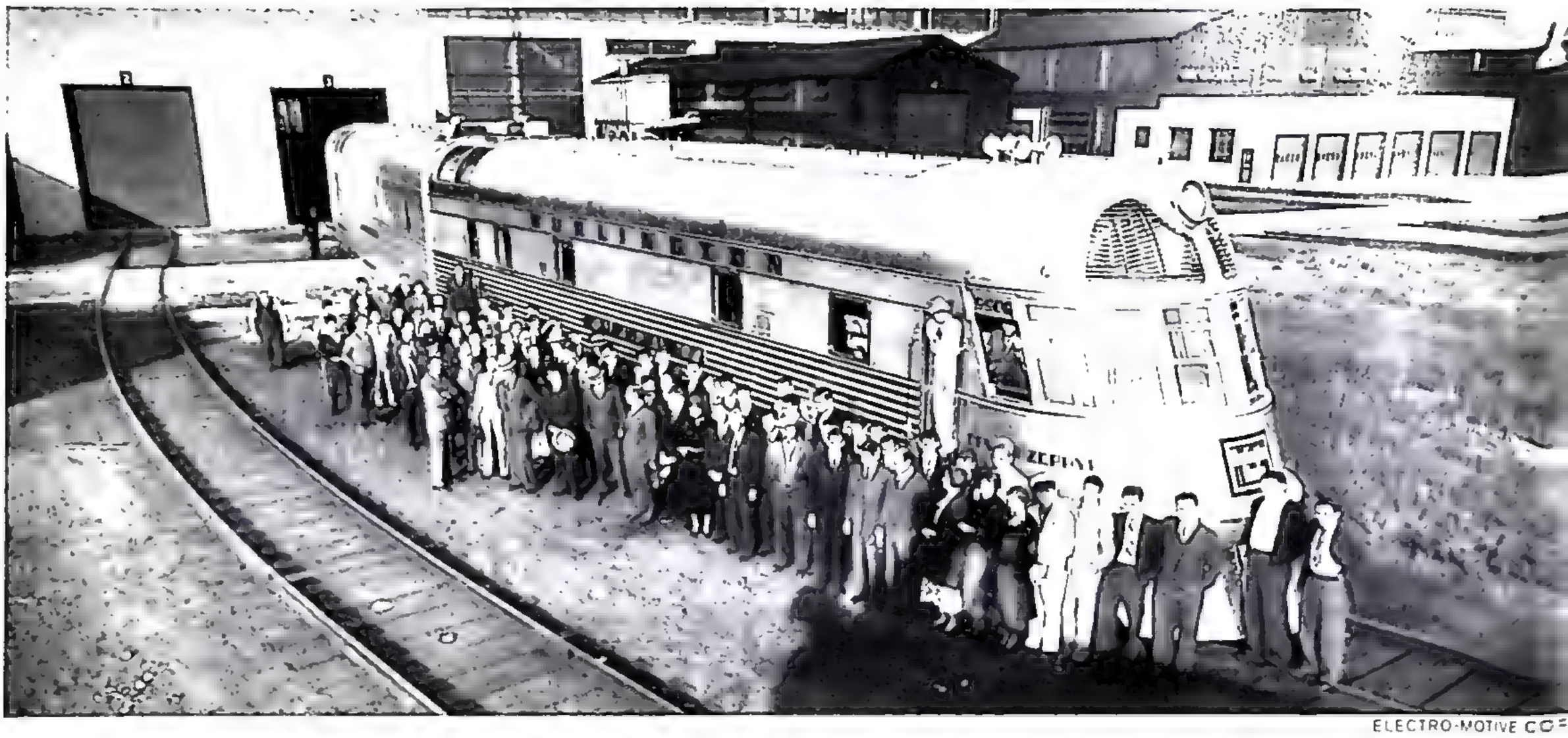
Only two Winton Model 194 engines, big 900 h.p. V-12's, were manufactured, one for Santa Fe's unique articulated car M-190, showing its stuff (above) with 15-car mixed train 79 on the Gridley branch south of Ottawa, Kans., on July 20, 1946. The two most famous "first streamliners" were Union Pacific M-10000 (right, leaving Chatsworth, Calif., on the SP during its 1934 tour) and Burlington's *Zephyr* 9900 (bottom, at St. Joseph, Mo., on the Kansas City-Lincoln run after its fourth car was added in June 1935).

Co. became Electro-Motive Corp., a subsidiary of General Motors. With GM's financial and managerial backing, all the tools and personnel were now in place for Kettering to lead development of a 2-stroke diesel engine for industrial, marine, and railroad use. Winton Engine would be a substantial part of that effort.

While Kettering had been experimenting with his diesel yacht in 1928, the U.S. Navy was pursuing its own investigation. Navy submarines couldn't keep pace with the surface fleet owing to antiquated engines. These 4-stroke diesels, based on German World War I designs, were heavy, about 60 pounds per horsepower, slow (475 rpm maximum), and directly connected to the propeller shaft, creating synchronous vibrations at higher speeds that tore apart engines, shafts, and propellers.

In early 1929, Capt. Harry Yarnell, chief of the Navy's Bureau of Engineering, ordered a review of the diesel engines then available in the market. He also requested a $2.1 million appropriation for diesel-engine and electric-drive development from Congress, but Congress procrastinated. In 1932, with the appropriation finally authorized, Yarnell's successor, Capt. Samuel Robinson, decided that the best use of $500,000 of these funds would be to run a design competition among domestic diesel-engine manufacturers.

In the depths of the Depression, word of the opportunity spread like wildfire. Winton, Sterns Mechanical Laboratories, Sun Shipbuilding, Electric Boat, and Continental Engine all responded by December 1932. In 1934, the Hooven-Owens-Rentschler Co. and Fairbanks-Morse Co. belatedly responded, at their own expense.



ELECTRO-MOTIVE CO

New plant, new technology—Electro-Motive Corp. employees pose with Burlington's 9906 A-B, *Silver King* and *Silver Queen*, the power for the first *Denver Zephyr*, at La Grange on October 16, 1936.

While the Navy struggled with its submarine problems, Winton Engine and Electro-Motive started development of a so-called distillate engine. Distillate fuel was defined as anything the refinery didn't want or couldn't use after "cracking off" gasoline from the crude oil. The term covered the range from low-grade gasoline to naphtha and kerosene.

Getting these fuels to burn in a beefed-up gasoline engine was difficult. The engines required several carburetors—sometimes one per pair of cylinders—and up to four sparkplugs per cylinder. Still, the need for higher horsepower existed, and the cost incentive to continue development intensified as the Depression deepened. During the first year of GM ownership, Winton introduced its Model 191 V-12 distillate engine that produced 600 h.p. at 1200 rpm.

The Winton Model 194 engine followed in 1932. A whopping 900 h.p. V-12, it was the heaviest and most powerful distillate engine ever manufactured. Only two were constructed, with one installed in Santa Fe's unique car M-190. The largest and most powerful doodlebug ever built, it had a power car, with the engine and controls, articulated to a baggage section. Re-engined about 1950 with a 1000 h.p. V-12 567 diesel, it served in New Mexico into the 1960's [pages 66-67, Winter 2004 CLASSIC TRAINS], and today is preserved in the California State Railroad Museum collection.

Winton's last motor-car distillate engine sale was a Model 191 installed in Frisco 2124. With that car's June 1933 delivery, the gas-electric era was over.

INTO THE STREAMLINE ERA

As one era ended, another began—the "Streamline Era." A month before Frisco 2124 was delivered, Union Pacific ordered from Pullman-Standard a three-car aluminum streamliner, the M-10000, and for that train, Winton on May 21, 1933, received what would be its last distillate engine order, a 600 h.p. Model 191. P-S completed construction of America's first streamliner on February 12, 1934, and delivered it to the UP on February 25.

While Winton was assembling and testing its last distillate engines, Kettering's research lab began experimenting with 2-stroke diesel designs. The first step was to have Winton build two single-cylinder (8-inch bore, 10-inch stroke) test engines, using the cylinder head, piston, connecting rod, camshaft, and valve gear from a production Winton 4-stroke marine engine.

These were unusual engines, conceived to run initially in 4-stroke-cycle mode and later be converted to 2-stroke operation. One engine remained in Cleveland; the other was shipped to the research lab in Detroit. It can safely be said that these two engines taught engineers much about what would *not* work in 2-stroke design!

Kettering in September 1930 sent his son, Eugene, to Cleveland to work at Winton with Carl Salisbury refining the unit injector. (Heading Winton's "Experimental Engine Department" was a nice start for Gene [1908-69], who attended Cornell University's College of Engineering. Subsequently, when the Model 567 diesel engine began production at La Grange in 1937, Gene moved to EMC as Assistant Chief Engineer reporting directly to EMC's original, and legendary, Chief Engineer Richard Dilworth. Upon Dilworth's 1948 retirement, young Kettering became Chief Engineer and stayed with EMD until his retirement in 1961.)

Through 1931 and into '32, the development of single- and multiple-cylinder prototypes continued in Detroit and Cleveland. At one point, Winton had five 1-cylinder and one 8-cylinder test engines running. A welded steel crankcase was developed, as was the "uniflow scavenging" design using air blowers with helical blades to continuously supply fresh air to each cylinder's inlet ports.

By December 1932, 2-stroke 6-cylinder Winton Model 201 diesels were pounding away on test stands at the Detroit lab. In what would be a peek at the future, Ralph Budd, president of the Chicago, Burlington & Quincy, visited Kettering at the lab and studied the diesel engines with great interest.

In late February 1933, the first 8-cylinder inline Model 201 Winton was under test, and none too soon, as GM had decided two would power the Chevrolet exhibit at the 1933-34 Century of Progress Exhibition in Chicago. In April, as two 8-cylinder engines were shipped to the Detroit research

Winton power plants

Winton Engine Company (1918-1930) • Railcar power plants

Date	Fuel	Model	Cylinders	Bore/stroke (in.)	Cycle	H.P.@RPM	Use
1918	Diesel	?	Inline-6	7.25 x 11	4	175@450	Marine (1)
1924	Gas	106	Inline-6	7 x 8	4	175@1000/1050	Marine/rail (2)
1925	Gas	106A	Inline-6	7.25 x 8	4	200/220@1000/1050	Rail
?	Gas	110	Inline-6	?	4	190@ ?	Rail
1925	Gas	120	Inline-6	7.5 x 8.5	4	275@1050	Rail
1927	Gas	146	Inline-6	8 x 10	4	300@900	Rail
1927	Gas	148	Inline-8	8 x 10	4	400@900	Rail

Notes: (1) Likely used in Kettering's 1st Olive K.; (2) References conflict

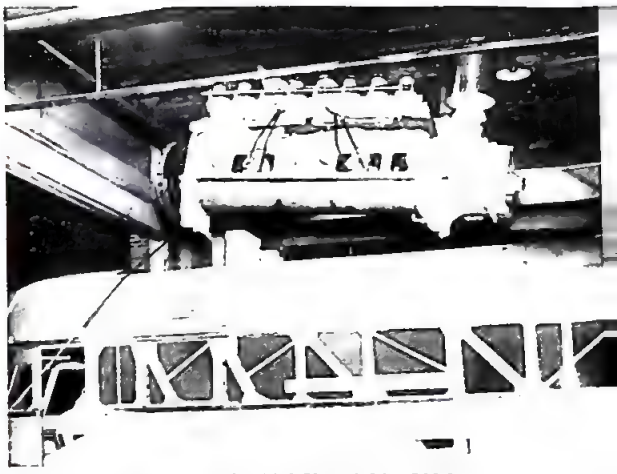
Winton Corp. Subsidiary General Motors (1930-1937) • Railcar/Locomotive/Navy power plants

Date	Fuel	Model	Cylinders	Bore/stroke (in.)	Cycle	H.P.@RPM	Use
1930-33	Distillate	191	V-12	7.5 x 8.5	4	600@1200	Railcars, UP M10000
1932	Distillate	194	V-12	9 x 12	4	900@900	ATSF M-190 railcar
1933	Diesel	201	Inline-8	8 x 10	2	600@750	Stationary (1)
1933	Diesel	201	V-12	8 x 10	2	950@720	U.S. Navy test(2)
1934-39	Diesel	201A	Inline-8	8 x 10	2	600@750	Railcars, locomotives
1934-39	Diesel	201A	V-12	8 x 10	2	900@750	U.S. Navy, locos.
1934-38	Diesel	201A	V-16	8 x 10	2	1300/1200@750	U.S. Navy, locos.
1937-37	Diesel	233	Inline-6	5.25 x 7	4	110/90@1050(?)	U.S. Navy/rail (2)
1936	Diesel	248	V-6, 8, 12, 16	8.5 x 10.5	2	6/8/12/1600@900	U.S Navy subs

Notes: (1) Auxiliary power in EMC box-cabs (2 EMC, 1 B&O, 2 ATSF) of 1935; IC 121 Green Diamond power car, and UP M10003-10006 locomotives of 1936. (2) Circa. Introduction date unknown; last recorded rail use 1937

Cleveland Engine Div. of GM (1937-1962) • Power plants derived from Winton 201A

Date	Fuel	Model	Cylinders	Bore/stroke (in.)	Cycle	H.P.@ RPM	Use
Ca.1938	Diesel	278	(Simplified stationary and commercial version of model 248)				
1943	Diesel	278A	V-6, 8, 12, 16	8.75 x 10.5	(Up-rated version of model 278 for US. Navy, industrial, and commercial use)		



CLASSIC TRAINS COLLECTION

In an EMC photo dated December 21, 1934, an 8-cylinder Winton 201A is suspended above what is likely one of the first *Twin Zephyrs*, delivered in April 1935.

lab for installation of the latest injectors and blowers, Charles Kettering met with Capt. Harold Bowen, assistant chief of the Navy's Bureau of Engineering. A V-12 Winton 201 was subsequently shipped to the Navy's Engineering Experimental Station in Annapolis, Md., for testing.

The installation of the two Winton 201 engines in Chicago was completed in May 1933 under Eugene Kettering's supervision. The engines successfully powered the Chevrolet Assembly Line exhibit at the Exhibition, but many a night was spent on modifications or repairs necessary to get them back on line the next day. During a speech to the American Society of Mechanical Engineers in November 1951, Eugene Kettering recalled the Herculean efforts made to keep those two World's Fair engines running with a telling comment: "Suffice it to say, I don't recall any trouble with the dipstick."

Meanwhile, the Winton 201 V-12 on the Navy test stand was producing 950 lh.p. at 720 rpm, and weighed only 12.6 pounds per horsepower. Of the five competing designs submitted for testing in 1933, the Winton 201 was the only one accepted by the Navy. (The Fairbanks-Morse opposed-piston engine, the only other design installed in U.S. Navy World War II submarines, was submitted in 1934.)

It was, of course, in front of those World's Fair engines that Ralph Budd and Fred Gurley of the Burlington Route convinced EMC's Richard Dilworth and GM's Charles Kettering to supply one 8-cylinder inline 600 h.p. model for their *Zephyr*, then under construction at the Budd Co.

Conversely, virtually unknown is the Navy order received by Winton on November 4, 1933, for 16 Model 201A V-16 engines rated at 1300 h.p.—four per vessel—to power four new submarines (*Porpoise, Pike, Shark,* and *Tarpon*). A second order followed in 1934 for 12 more V-16 201A's for *Perch, Pickerel,* and *Permit*. Winton shipped its first V-16's to the Navy in November 1934.

Interestingly, railroad and Navy documentation both claim the 201A designation represented the engine modifications made for their application. In fact, the 201 model was applied only to test engines including the V-12 sent to the Navy and the twin straight-8's used at the Chicago fair. All others, rail and Navy, were of the modified "A" design.

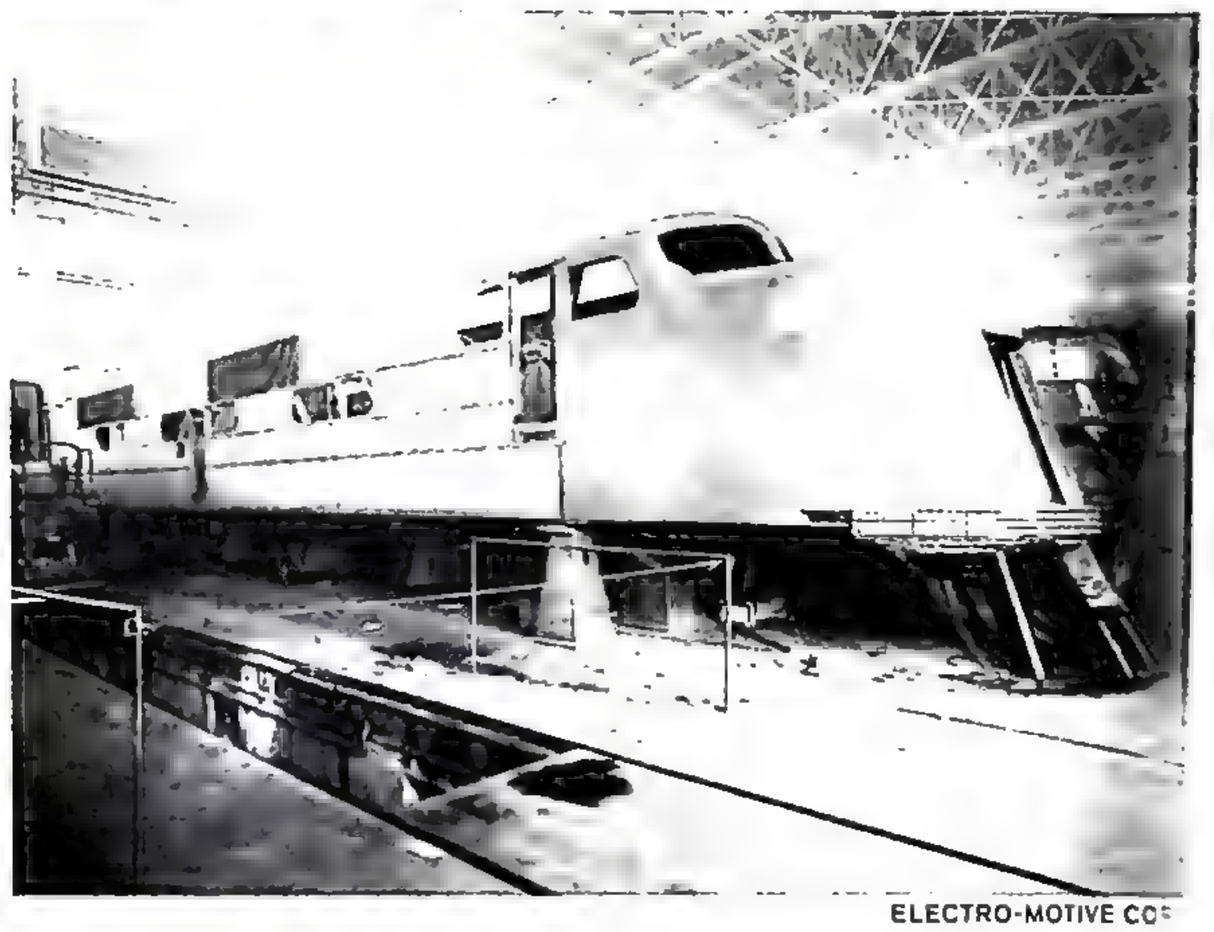
The Navy bought only the V-16 201A model, and restricted its engineering input to that specific design. However, the Navy's requirements did result in certain construction features needed for marine applications—undesirable for locomotive use—being shared with the straight-8 and V-12 models.

Winton's finest hour had arrived. During 1933-35, Winton Model 201A engines were the first modern "high speed" (750-1000 rpm) diesel engines installed in U.S. Navy submarines, in streamlined articulated passenger trains like the *Zephyr*, and in five high-speed road locomotives. Though diesel switchers had been around for a decade, these five box-cabs—EMC 511-512, B&O 50, and Santa Fe 1A and 1B—were the first individual-unit (non-articulated) diesel road locomotives.

Finally, in May 1937, Winton 201A's powered EMC's first E unit, Baltimore & Ohio EA No. 51A, sire of a line of more than 1300 EMC/EMD E-series passenger locomotives. "E" stood for "eighteen-hundred," the combined horsepower output of the unit's two Winton V-12's. Although EMC's new 1000 h.p. V-12 Model 567 engine superceded the V-12 201A in late 1938, the "E" label stayed, and it defined Electro-Motive's passenger locomotive models through the last 2400 h.p. E9,

A. P. FORMANEK, RAILROAD PHOTOGRAPHIC CLUB

ALEXANDER MAXWELL



ELECTRO-MOTIVE CO

EMC's box-cabs sired the E-unit line. B&O 50 (top, leading the *Royal Blue* in New Jersey with a "lean" caused by the camera's focal-plane shutter) was the first separable road unit. "Santa Fe 1C" (above, in Chicago), was in reality one of EMC's two demonstrators, 511-512, borrowed after a fire in one of Santa Fe's own box-cab "One-Spot Twins," and then kept for a time as a backup unit. B&O 1800 h.p. EA 51A (above right, under construction in 1937) was the first of more than 1300 E units.

No. 914 of Union Pacific, which was delivered in January 1964.

Winton's record of accomplishment is something no other diesel engine manufacturer of the era can approach.

WINTON WINDING DOWN

As successful as the 201/201A engine was, the relationship among the research laboratory in Detroit, Winton in Cleveland, and, by late 1935, EMC's new plant in La Grange, Ill., was deteriorating quickly. Lack of communication and turf battles plagued the efforts to keep the early locomotive and submarine engines running. The injectors and other close-tolerance components were manufactured at the research lab, then shipped to Cleveland or La Grange. Winton accused the technicians at Detroit of impossible requirements, and the technicians grumbled about ham-handed assemblers in Cleveland and La Grange. Frustration and infighting reached such levels that Kettering threatened to shut down Winton.

In 1935, Eugene Kettering and Carl Salisbury began development of a successor to the 201A engine aimed specifically at the U.S. Navy submarine program. Winton introduced the Model 248, a V-16 rated at 1600 h.p. with improved maintenance access, injectors, and reliability in 1936. The Navy started buying them and continued with improved Models 278/278A throughout World War II. By war's end, more than 560 model 248/278/-278A engines had been bought for submarine service, plus thousands more for surface vessels and many military and industrial uses. All earned a reputation for toughness and reliability.

With the Model 248 project done, Kettering and Salisbury moved to the research laboratory in Detroit in fall 1936 to began design of the legendary Model 567 engine. The last Winton-powered locomotives left La Grange in May 1939, and the landmark Model 201A was discontinued.

In 1937, GM reorganized Winton Engine as its Cleveland Engine Division, and limited its market to marine and stationary power plants. Clevelan

JIM C. SEACREST

Representing the 174 Winton-engined "conventional style" (end-cab) EMC switchers built during February 1935-May 1939 is SW (600 h.p., welded frame) No. 5, a July 1938 product for MoPac subsidiary St. Joseph (Mo.) Belt. It was later assigned to St. Joe Union Terminal, which had been dissolved when 5 was parked at Lincoln, Nebr., on September 16, 1961. It had moved north to help local Geeps handle the grain harvest.

continued to produce both 2- and 4-stroke engines for these markets, making it the only GM division to design and sell 4-stroke diesel power.

Concurrent with Winton's 1937 reorganization, the research laboratory's equipment and some personnel went to the newly formed Detroit Diesel Division of GM. Now for over 65 years, Detroit Diesel has manufactured smaller diesel engines for truck, bus, marine, and other applications.

In 1939, four 90 h.p. 6-cylinder inline Detroit Diesel Model 71 2-stroke engines were installed in the auxiliary baggage-dormitory car for UP's *City of Portland*, an application where, a year or two earlier, four Winton Model 233 engines would have been used.

Electro-Motive at La Grange had been assigned Winton's locomotive applications from its mid-1935 opening. The ultimate success of the Model 567 engine would expand EMC/EMD's market into skid-mounted power-generation units and medium-size ship power—World War II LST's (Landing Ship, Tank), for example.

After the war, many Cleveland Engine model 248/278/278A engines were removed from scrapped U.S. Navy vessels, rebuilt, and sold on the open market, diminishing Cleveland's market share. In 1948, EMD absorbed Cleveland Engine's World War II-era facility in Cleveland to help fill the flood of postwar locomotive orders. As employees of what now was EMD plant No. 3, former Cleveland personnel were incorporated onto EMD's payroll. GM officially closed the Cleveland Engine Division in 1962, and wholesaled its replacement parts business off around 1970. Replacement parts were available for several Cleveland Engine models, including the 278/278A engines, as late as the mid-1980's.

WINTON PRESERVATIONS

Physical remains of the Cleveland Engine/Winton Engine era are not extensive, but they do exist. The 1920's buildings housing Winton Engine and the 1940's Cleveland Engine/EMD facility remain standing in Cleveland, occupied by light industry. At least eight World War II diesel-electric submarines remain as memorials. Presumably most still contain their Cleveland power plants, but likely in far-from-operable condition.

Most of the early 201A-engined articulated streamliners are long gone, but amazingly, one of the two Winton 201's that powered the Chevrolet Exhibit at the Century of Progress Exhibition still exists. Stored at a GM facility near Detroit for decades, it recently was donated to the Illinois Railway Museum at Union, Ill. More than 70 years after Eugene Kettering sweated over and nursed it, the only Model 201 in existence is a rare specimen indeed, and truly the patriarch of all GM 2-stroke power plants. Accompanying it in the IRM collection is a Winton-powered 600 h.p. SC switcher built in 1937 for the Missouri Pacific.

In 1960, the *Pioneer Zephyr* was retired and placed on display outside Chicago's Museum of Science and Industry, where it resided for the next 35 years. In the late 1990's, the train—including its (second) 201A engine—was moved to Milwaukee, Wis., and immaculately restored, then moved back to Chicago to be part of an extensive indoor display.

The *Zephyr*'s first 201A, the one that powered it into the speed-record books, rests, externally restored, in the Smithsonian Institution in Washington, D.C. EMD General Manager Richard L. Terrell presented it with appropriate ceremony on June 30, 1964.

The *Mark Twain Zephyr*, a near twin to the original Burlington 9900, still exists as a gutted hulk outside Chicago. Its 201A was removed years ago and resides at the University of Wisconsin's College of Engineering in Madison.

The Museum of Transportation in west suburban St. Louis houses the largest Winton collection, with two locomotives and one gas-electric car. The oldest is ex-Boston & Maine gas-electric 1180, which contains a 275 h.p. Winton gas engine and dates from 1926. Nearby is B&O box-cab 50, which also contains its original twin 900 h.p. V-12 Model 201A power plants. The third unit is an ex-Birmingham Southern 900 h.p. NC1 switcher built at La Grange in 1937.

B&O 51A, the first E unit, stands in

***Zephyr* 9900's near twin and "New England's first streamliner," the $280,000 *Flying Yankee* of Boston & Maine and Maine Central, departs Portland (Maine) Union Station for Bangor in September 1939. Amazingly, in 2004 it is being overhauled to once again operate, Winton and all!**

its regal *Royal Blue* colors at the B&O Railroad Museum in Baltimore. In 1953-54, this unit, along with its original 11 sister EA/EB units, were traded to EMD to be "remanufactured" into new E8AM/E8BM's. (The original generators were reused, which limited the normally 2400 h.p. unit to 2000 h.p., resulting in the "M" suffix.)

In a stroke of good fortune, however, after 51A was stripped and the trade-in credit allowed, someone at La Grange with authority and a sense of history offered the remains of the first E unit to the B&O for preservation. It still contains its twin V-12 Wintons, but they are forever silent, for 51A's traction motors and generators were removed and reused.

Also gone are virtually all the 174 600 h.p. and 900 h.p. switchers produced at La Grange between 1936 and 1939, the SC, SW, NC, and NW series (S = 600 h.p., N = 900 h.p., C = cast frame, W = welded frame).

As late as 1971, 10 of these switchers were reported by the locomotive magazine *Extra 2200 South* to still be in service. By then, about one-fourth (45) had been scrapped, with a dozen rebuilt to slugs and a few more traded in on newer switchers. About half (88) were still in use, although repowered with Model 567 engines. Likewise, the early EMC/Winton gas-electric motor cars were a prime subject for repowering with EMD or other manufacturers' 600 to 750 h.p. diesels in the post-World War II years.

A GEM, ON TRACK TO RETURN

One more example, and a stunning one at that, exists. The second diesel-electric streamliner, Boston & Maine-Maine Central's *Flying Yankee*, after completing a 2.75-million mile career in 1957, was "stuffed and mounted" like *Zephyr* 9900, in Massachusetts. Also like the *Zephyr*, the New England train since the mid-1990's has been undergoing restoration—not for display, but for operation under its own power.

Individually cast cylinder liners, bearing brasses, piston crowns, injectors, and other new or rebuilt components are fitted into that 1935-era Winton block, which has been remounted in the *Flying Yankee*. But which engine is it? The train's original 201A power plant needed extensive repairs in 1947, so B&M's mechanical department swapped in an identical engine from B&M SC switcher 1103, built by EMC in 1936. Presumably 1103 got the *Yankee*'s engine after a more leisurely rebuilding than the shop schedule of the streamliner allowed.

Existing B&M mechanical records do not indicate that the prime movers were swapped back later, but the Winton builder's plate number, 529, on the *Yankee*'s engine indicates this must have occurred.

Regardless, the day appears near when that Winton will fire up for the first time in nearly a half-century. One hopes it won't take four days to start, as legend says it took the boys from EMC, Winton, and Budd in 1934 to get the *Zephyr*'s 201A to turn over.

The *Yankee*'s resurrected 8-cylinder inline 201A will be the world's only operable Winton engine. As such, it will be an appropriate tribute to Alexander Winton, Carl Salisbury, "Boss Ket" Kettering, Eugene Kettering, and the thousands of others who designed, built, and serviced Winton, Cleveland Engine, Detroit Diesel, and Electro-Motive products over the past 80 years.

Today, 145 years after Alexander Winton was born, the story endures. Yes, Winton and Cleveland Engine are gone, but the lessons learned from the Winton 201/201A engine were embodied in both EMD and Detroit Diesel's lines of 2-stroke diesels that are still being built and continue working worldwide today. It's a heritage worthy of remembrance. ■

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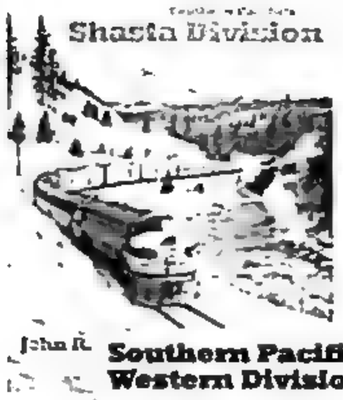

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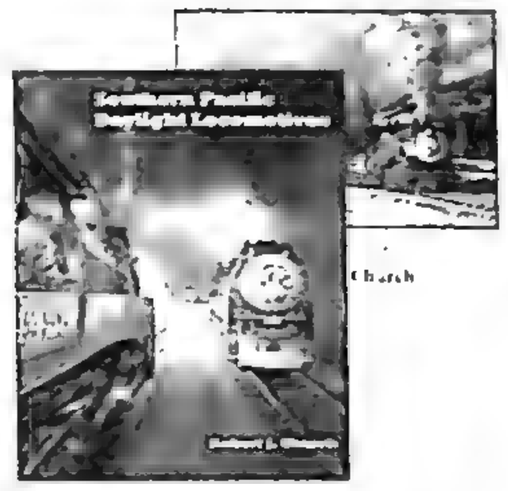

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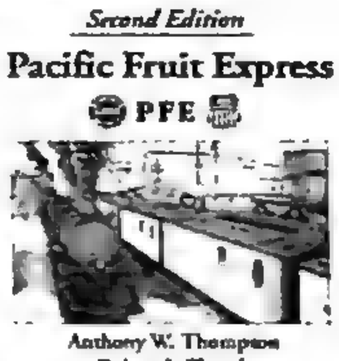

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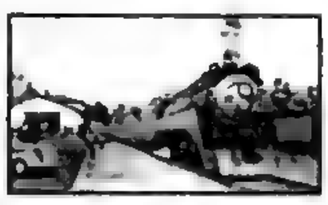

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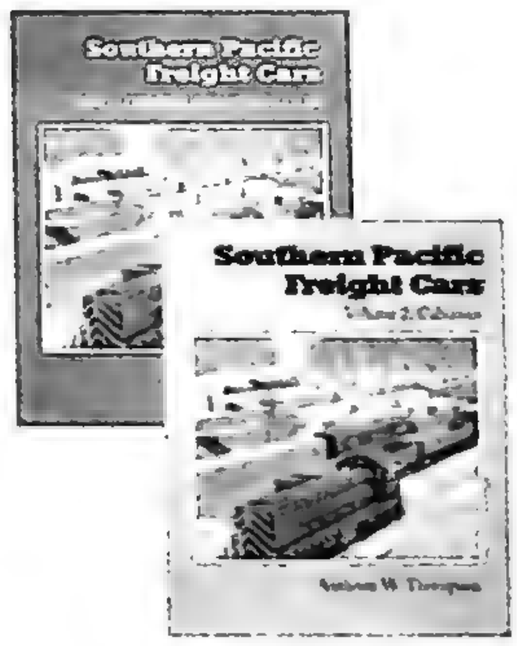

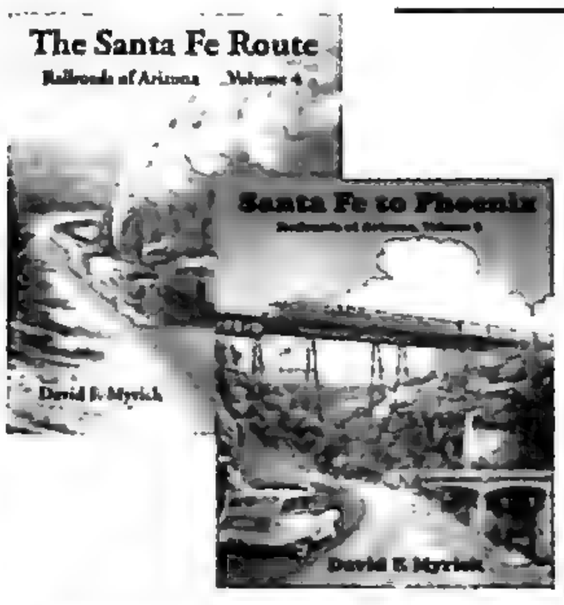
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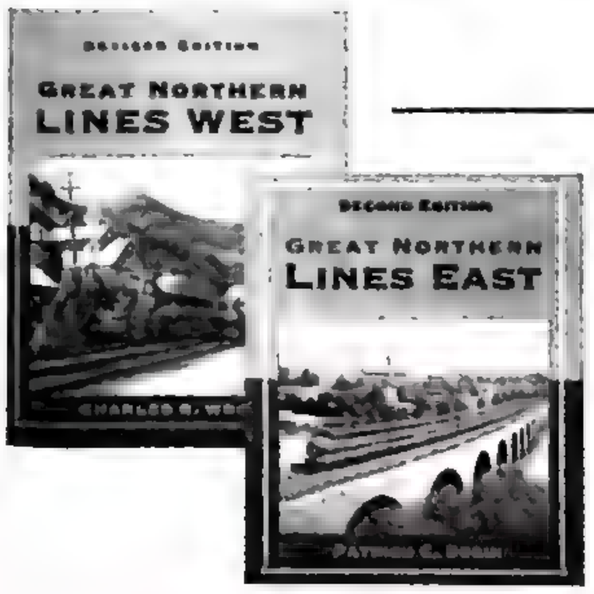

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ROYAL BEAUTY: Beginning in 1936, Canadian Pacific motive-power chief Henry B. Bowen designed three classes of semi-streamlined steam. Most famous were the 45 4-6-4's of 1937-40, called Royal Hudsons after one pulled the King and Queen of England across Canada. No. 2841 is at Toronto, near CP's Royal York Hotel.

LIGHT TOUCH: Running-board skirting, modern pilot, and fancy paint are about all that separated Frisco's 10 4-6-4's from standard power. Rebuilt from Pacifics in 1937-41, the Hudsons were not the jazziest steam on the Frisco—three 1910 Pacifics got the full treatment in 1939 for the *Firefly*.

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CALMED WIND: Louisville & Nashville 4-6-2 295 stands at Winchester, Ky., with local 3 for Hazard on May 3, 1952. Built in 1925 with three cylinders, 295 lost one cylinder and gained a big tender and some decorative sheet metal in 1940 to pull L&N's Louisville-Montgomery, Ala., leg of the Chicago-Miami *South Wind* streamliner.

SANTA FE STYLE: In 1939 Santa Fe created the *Valley Flyer*, a Bakersfield-Oakland train to handle San Francisco World's Fair traffic. Six heavyweight cars and two old 4-6-2's, 1369 (at Bakersfield in 1940) and 1376, were spiffed up for the train, which ATSF transferred to its Surf Line after the fair.

The Rock's Camelot

Reflecting on that brief, shining moment when the Rock Island was among the best, and how its Rockets made it so

BY PETER A. HANSEN

An atypical train at an atypical spot: The four-car *Peoria Rocket*, which mostly split farm fields as it rode Rock Island's Illinois River valley rails 161 miles to Illinois' second-largest city, was 4 years, 1 month old as it rolled through Split Rock Tunnel near La Salle behind TA 603 on September 29, 1941.

THE CHICAGO, ROCK ISLAND & PACIFIC was bankrupt. Again. On June 7, 1933, the company sought protection from creditors for the second time in its history. Granted, the CRI&P was hardly alone in this during the Depression years, as more than 20 other Class 1's were in similar straits. What distinguished the Rock Island was that it had often been a hard-luck player, even when it was technically solvent. Moreover, as would be shown in the late 1930's, "the Rock" was distinguished further by a new, audacious management team that did the unexpected and achieved undreamed-of results.

Like many granger roads, the Rock Island, whose first rails were laid in 1851, grew by mergers, leases, and new construction throughout its initial half-century, reaching its tentacles into seemingly every dale and creekbed of the rural Midwest. (Slogans around its 1950's *Official Guide* map trumpeted "Rock Island Lines serve 14 Western states" and "Over 8000 miles of modern railroad.") That the resulting network made for roundabout routes between major cities, and that the Rock reached some of those cities only by trackage rights, didn't seem to be much of a problem, as long as the Farm Belt prospered.

During the Great Depression, it didn't prosper. The entire Midwest was in the grip of an extended drought, and the southern Great Plains in particular suffered the rav-

DAN K. PETERSON PHOTO ALBUM ONE COLLECTION

ages of the Dust Bowl. Agricultural traffic evaporated to a trickle.

It didn't help that the Rock Island had been mismanaged for 30 years before 1933. Not once, but twice the railroad was bled white to prop up the ambitions of outsiders. A group of investors known as the Reid-Moore Syndicate turned their attentions from Nabisco and Diamond Match in 1901, thinking to use the Rock Island as the centerpiece of a transcontinental railroad empire. While successful railroads were making the transition from shoddy initial construction to modern transportation systems, the Rock's capital was being used as collateral for more acquisitions. Eventually, the obligations outstripped income and RI filed its first bankruptcy petition in 1915.

The Reid-Moore Syndicate was out, but the reorganization scarcely reduced the company's debt. By the 1920's, history was beginning to repeat. Frisco chairman Edward N. Brown began buying Rock Island stock for his own corporate treasury, and simultaneously, as a member of the Rock's corporate board, he persuaded his fellow directors to approve dividends of up to 7 percent—good for Frisco, bad for Rock Island. Once again, money that could have improved the property was spent elsewhere, and when the Depression arrived, there was little left to see the Rock Island through hard times.

In 1935, with Rock Island's books full of red ink and its tracks deep in Dust Bowl drifts, there was little to suggest that things were about to get better. Amazingly, though, they did.

PLANNED PROGRESS

Court-appointed trustees now were calling the shots, and even though one of them was Rock Island's aging president, James Gorman, they concluded that new top management was needed. The trustees turned to Edward M. "Ned" Durham, a civil engineer by training but also regarded as a good

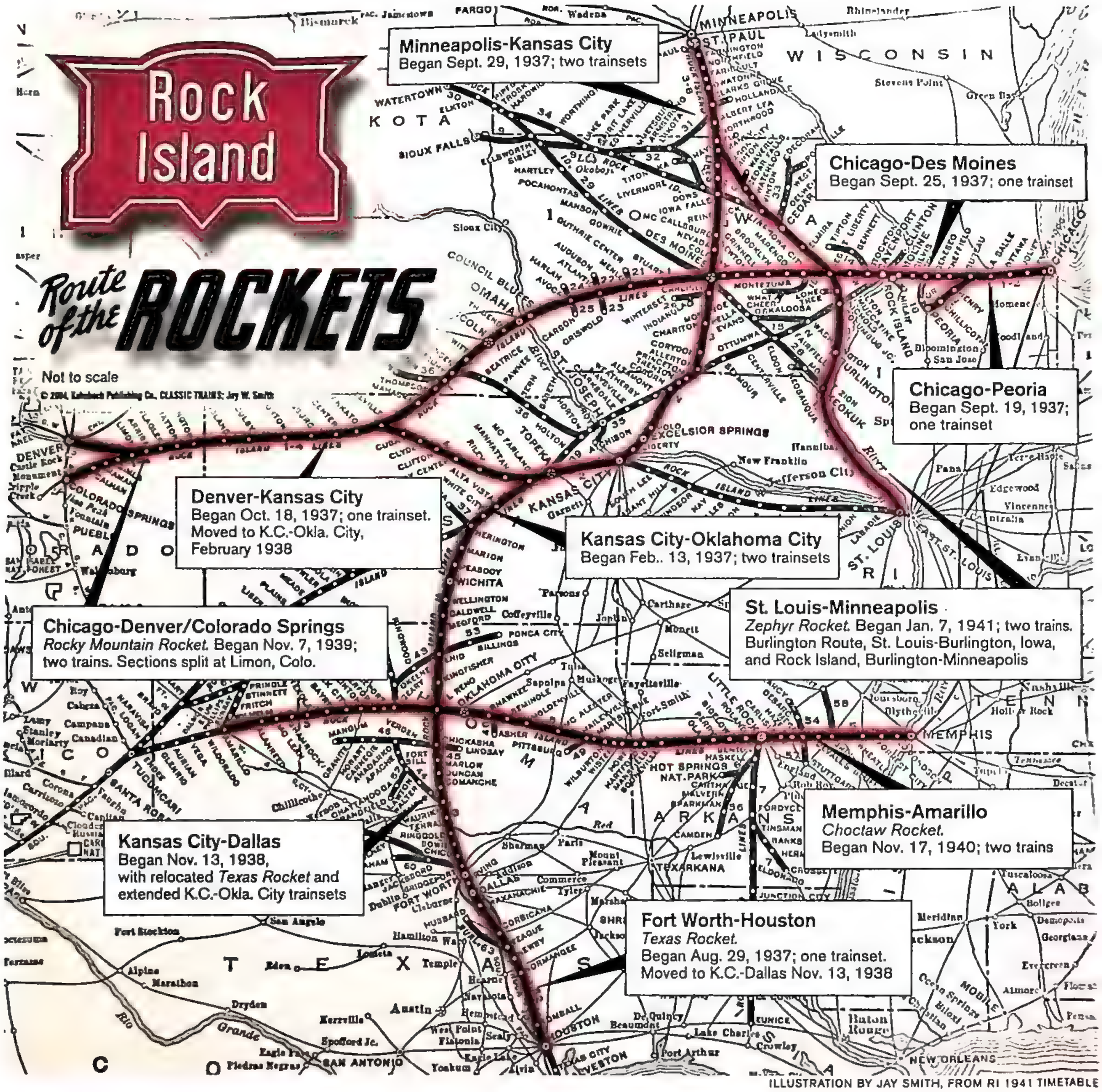


ILLUSTRATION BY JAY SMITH, FROM RI 1941 TIMETABLE

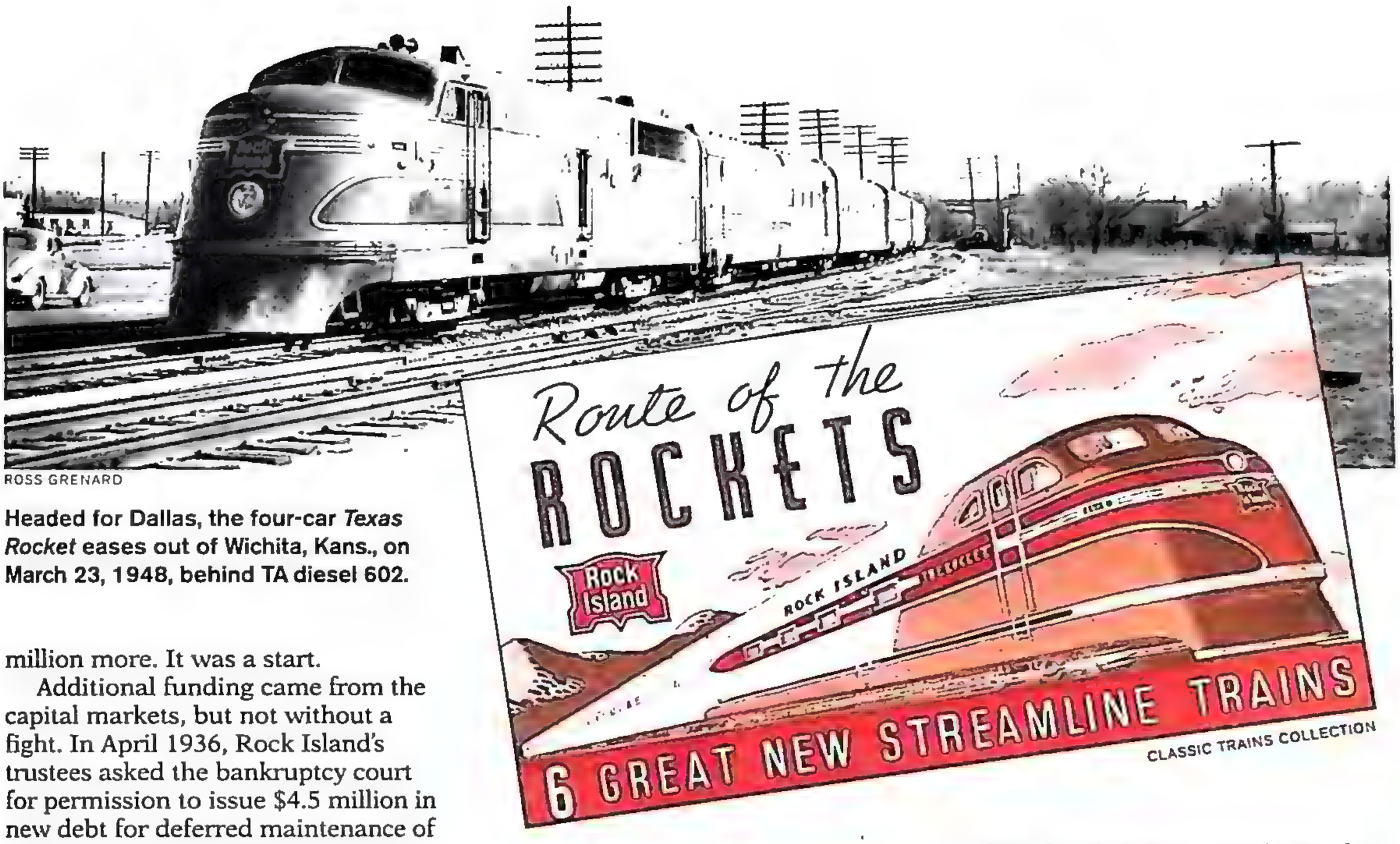
Routes of the original *Rockets* are highlighted in red. Small numerals next to each route indicate the Table Number in the January 7, 1941, RI public timetable where train schedules would be found.

operating man. A senior vice president with Missouri Pacific, he had previously worked in the engineering departments of Chicago & North Western and Southern Railway. The Rock's Durham era began on January 1, 1936.

Durham, in turn, hired 45-year-old John Dow Farrington as his chief operating officer. Farrington, the son of a Great Northern vice president, had made his own reputation as general manager of the Fort Worth & Denver City, the Texas operation of that Prince of Grangers, the Burlington Route. He brought in 12 good men, mostly from "the Q," to fill out CRI&P management ranks and put a stop to the factionalism that had gnawed at the company and sapped its productivity.

If there was ever to be hope for the Rock Island, it had to start at the most fundamental level—with the track. As *Fortune* magazine observed, "Even if the road had been in perfect condition, it would have been a 1916 plant trying to produce a 1936 product." Not only did the physical plant have to be improved just to bring it up to 1916 standards, it had to catch up on the modernization it had missed in the two decades since.

The new team didn't have much with which to work. When Farrington made his first inspection trips, he found a dispiriting succession of slow-speed track, out-of-service rolling stock, and just plain junk. He ordered a systemwide scrap drive that ultimately raised over $5 million from old lightweight rail alone. Other scrap, including replacement of worn-out bridges and rolling stock, netted $5



ROSS GRENARD

Headed for Dallas, the four-car *Texas Rocket* eases out of Wichita, Kans., on March 23, 1948, behind TA diesel 602.

million more. It was a start.

Additional funding came from the capital markets, but not without a fight. In April 1936, Rock Island's trustees asked the bankruptcy court for permission to issue $4.5 million in new debt for deferred maintenance of way and structures. Existing creditors, fearful that their position might be compromised, argued forcefully against approval, first before the bankruptcy court and then before the Interstate Commerce Commission. In the end, however, the judge and the ICC allowed the bond issue to proceed.

It was the beginning of a program called "Planned Progress"—and while Farrington would justly be given most of the credit for the Rock's turnaround in subsequent years, it should be noted that the plan had begun to take shape several weeks before he arrived.

When the Rock hit bottom in 1935, the company estimated it would take $18 million to address the deferred maintenance and position it for anything like normal operations. By 1941, Farrington could tell the court that his team had accomplished all but $1.5 million of it. In so doing, they had set the stage for the *Rockets*, the road's fleet of modern passenger trains.

"THE HARDEST THING . . ."

Rock Island folklore tells of passengers who were so accustomed to late trains that they became indignant when operations started to be on-time. Chalk it up to the same "Iowa stubborn" attitude celebrated fondly in *The Music Man*. Change can be unsettling, and it must have been downright shocking to see fast, on-time streamlined trains on the Rock Island. Apart from the Chicago Cubs winning the World Series, it's hard to imagine anything that would have astonished the nation's heartland more.

"The hardest thing we had to do," Farrington recalled in 1944, "was to live down the Rock Island's reputation. After six months, I recommended the purchase of six streamlined trains. We had to re-establish our identity with the public. I was sure the new trains would do it."

As important as it was to convince the traveling public, the employees also needed the morale-booster. The *Rockets* succeeded on both counts.

The first mention of the new trains in the bankruptcy court files is dated November 17, 1936. The court's permission was sought for the issuance of $2,550,000 in bonds for the purchase of 350 automobile boxcars, 20 passenger cars, and 6 diesel passenger locomotives. The dry legalese of the petition belies the budding revolution.

What's not dry is the reaction of the creditors to the request. If some of them had had their way, the new trains might never have become a reality.

Although things had begun to look up after Durham and Farrington came on board earlier that year, the Rock Island was still very much at the mercy of the court, its creditors, and its past. When the road declared bankruptcy, it was $31 million in debt, and the court-appointed trustees realized there was no way to meet the obligations coming due. They asked for a three-year moratorium on payments, but now that period had almost run its course and still the Rock Island was vague about resumption. In fact, with $11.6 million in obligations maturing on January 1, 1937, the trustees were asking to take on even more debt.

It's a tribute to the company's attorneys that they were able to make their case successfully. Counsel argued that most of the other railroads in bankruptcy had been allowed to renegotiate their debt down to lower rates, but that the Rock Island had not—and they implied they would withhold payment of any obligations due on January 1 unless the creditors played along.

Judge James Wilkerson asked the railroad's attorneys to be more explicit: Did they intend to default, or not? When they replied that they wanted only to discuss various options, Wilkerson grew notably peeved, asking why the trustees, "an arm of this court," had not come prepared with a firm plan.

Counsel for the creditors jumped in and argued they had shown good faith

J.M. GRAY

In a photo emblematic of small boys' fascination with trains everywhere, and of the steam-to-diesel transition, RI local freight 175, behind a C-43 class 1906 Baldwin 2-8-0, waits in the siding at Hagen, Ark., for a Memphis-bound *Rocket* to rush by.

when they agreed to a moratorium three years earlier, and they didn't think they should be rewarded with default. Moreover, earnings had improved since 1933, and the railroad was actually paying less in debt service as a proportion of earnings than it had before declaring bankruptcy.

After two hours of sometimes acrimonious arguments, the court adjourned with no resolution in sight—and the *Rockets* hanging in the balance. Sometime before court convened the next day, however, the attorneys for both sides struck a compromise, and Judge Wilkerson agreed: Rock Island would make a payment equal to 10 percent of the $11.6 million about to come due, and the company would be allowed to borrow more for the new trains. The *Rockets* would be ordered a month later, following the formality of Interstate Commerce Commission approval.

A STUDY IN EVOLUTION

The trains were an interesting evolutionary step in the still-new art of streamliners, borrowing from the trains that had gone before and foreshadowing some changes to come. Like the Burlington's *Zephyrs*, the *Rockets* were built of "18-8" stainless steel, an alloy with 18 percent chromium and 8 percent nickel, resulting in high tensile strength and extraordinary shine. Also in common with other Budd-built passenger equipment, the *Rockets'* car sides were fluted for more rigidity. Like many early streamliners, the trains were articulated, with each pair of cars sharing a common truck.

Articulation saved weight, made for better tracking, and reduced aerodynamic drag, but it also hampered operational flexibility. Rock Island was among the last roads to order such cars, and it, too, found the arrangement was more trouble than it was worth—subsequent cars would each be separate vehicles with two trucks. The cars were also built with underbody skirting, and many kept this feature until the end of their service lives more than 20 years later.

The initial order of 20 cars made for six trainsets: two with 4 cars each, and four with 3 cars each. These were day trains—each had a baggage-dinette-coach, a 76-seat coach, and a round-end observation-lounge; the 4-car trains had an additional 60-seat coach. On 3-car trains, the lounge car seated 52, half in a conventional coach configuration at the forward end of the car and half in the lounge at the rear; a bar was between the sections. Observation cars for the 4-car trains seated 36 in two lounge areas separated by a bar, and they also contained a 5-seat drawing room.

The interiors were just as striking as the flashy exteriors. Each type of car was decorated in a different scheme: the dinettes in shades of green; coaches in gray, purple, and blue; observation cars in blue, brown, and gold. It's hard to overstate the effect of such cars on Depression-era Americans who had despaired of ever again having anything new.

Perhaps the most interesting aspect of the first *Rockets* was their motive power. Whereas the earliest Burlington and Union Pacific streamliners had only a powered leading truck, with the trailing truck articulated with the first

car, Rock Island went for a separate locomotive. Forsaking the turret cabs and *Zephyr*-style shovel-noses of earlier trains, the *Rockets* were among the first to be powered by what came to be known as cab-unit locomotives. With elegant, deeply raked prows, the units looked like baby brothers to the slightly earlier E1's that powered the Santa Fe's 1937 *Super Chief*.

Built by Electro-Motive Corp., the *Rocket* locomotives were designated as model TA (twelve-hundred horsepower, A unit), and Rock Island had the only six ever built. They had a B-B wheel arrangement (vs. A1A-A1A for the 1800 h.p. E1's), and their single 16-cylinder Winton 201A diesel engine sufficed for the short trains they were built to pull (the E1's each had two 12-cylinder 201A's). The TA's were a forerunner of Electro-Motive's F-unit series, launched with the FT of 1939. Although the TA's would prove unequal to more demanding assignments in later years, they were more than adequate to the task of pulling the initial *Rockets*, and their 52:25 gearing was good for 110 mph.

EMC's famous design shop also gave the TA's the paint scheme that would be the base for RI's image for over two decades: a striking application of the "bow wave" theme, rendered in scarlet and crimson. The rear half of the carbody was stainless steel, providing a smooth transition to the cars behind. Gleaming under a coat of wax for their early publicity tours, the TA's were indeed eye-catching.

More important, the *Rocket* streamliners would turn a profit and help restore their owner's tarnished image.

TWO PHOTOS, HARRY J. HEANEY, JOE R. THOMPSON COLLECTION

The *Texas Rocket*, RI's first, was 6½ months old when it pulled out of Houston (top) on March 13, 1938. Note its unique lettering: the joint BURLINGTON-ROCK ISLAND on the cars (above, in Houston Union Station), and the train name on TA 602's emblem.

ROCKET LAUNCH

The *Texas Rocket* was the first to debut, on August 29, 1937. Ironically, it was somewhat anticlimactic, being the second diesel streamliner on the Fort Worth-Houston route. Burlington's *Sam Houston Zephyr* had entered service on October 1, 1936, using a trainset bumped from the Chicago-Minneapolis *Twin Cities Zephyr* when that route demanded a longer train.

Moreover, the *Sam Houston Zephyr* and *Texas Rocket* ran on the same track, in reality being two halves of the same service on the jointly owned Burlington-Rock Island Railroad, a marriage of convenience for the grangers between Fort Worth/Dallas and Houston (and a route with no large intermediate towns). The Rock Island's train, with TA 602 and three cars, was unique among the *Rockets* for its BURLINGTON-ROCK ISLAND lettering, and because 602's nose logo had the train name instead of the road name.

More typical of the trains to follow, the second RI streamliner became the *Peoria Rocket*, linking Chicago with what then was Illinois' second-largest city, 161 miles down the Illinois River. Service began on September 19, 1937, with TA 603 and its 4-car train in full Rock Island regalia. More substantively, the service shortened the running time on the route by a full 55 minutes. A 2-hour, 35-minute schedule, including four stops, made for some fast running (frequently topping the 90 mph mark), and it also allowed the trainset to cover two daily round trips. The route was important to the Rock Island, and a rarity for it, because it had no significant rail competition.

The network continued to expand, with the Chicago-Des Moines *Rocket* and the Minneapolis-Kansas City *Rocket*, both of which debuted the following week. The latter train slashed 5 hours, 50 minutes on its 493-mile route, an impressive performance that turned a plodding 14-hour overnight run into a daytime market for the Rock Island. Two of the 3-car sets were assigned to this run, providing a daily trip in each direction. The Des Moines train had a 4-car set, and together with the *Peoria Rocket* provided a third round trip on the eastern portion of its route, Rock Island's busiest corridor.

The sixth and last of the original *Rocket* trains entered service between Kansas City and Denver on October 18, 1937, and once again, its speed turned an overnight market for Rock Island into a day trip. The 3-car trainset lasted in this service for only four months, however, before being shifted to the Kansas City-Oklahoma City run effective February 13, 1938.

One factor was the relative lack of population on the 635-mile distance between K.C. and Denver. The seeds for the abrupt change, though, had been sown before the Denver train entered service. As first conceived when the *Rockets* were ordered, the K.C.-Denver route was to have been pro-

IRA H. EIGST

The *Peoria Rocket* was in its eighth year on October 11, 1945, when, at 2 p.m. as train 504, on the day's second trip to Chicago, it called at Bureau, where the Peoria branch met the main line. By age 10, the twice-a-day train had carried 2.3 million riders.

tected by two trainsets, providing daily service in each direction. When one of those sets was assigned to the *Texas Rocket*, the Denver service became a tri-weekly operation, and Rock Island learned how tough it is to build a market without daily service.

Notwithstanding the Kansas City-Denver misstep, the *Rockets* made a splash with employees, railroad officials, and the traveling public. Just as Farrington had predicted, the trains were helping the railroad live down its bad reputation, and in those terms alone, the *Rockets* earned their keep. They also happened to be profitable, returning all of their initial $2.2 million investment within three years. There was clearly a market for such trains in 1930's America: Farrington's intuitive hunch was confirmed, without benefit of any marketing studies.

There could be little doubt that the Rock Island was coming back from the dead. Incredibly, it hadn't even been two years since Durham and Farrington came on board.

SECOND GENERATION

Success for the initial *Rockets* bred an appetite for more. Rock Island's trustees again petitioned the bankruptcy court for permission to acquire more new cars and locomotives, and this time, creditors didn't protest. Not only had the first trains paid for themselves, but everyone now understood their symbolic importance as the most visible sign of a Rock Island revitalization that also included better track, modern signaling, and rebuilt bridges.

Much remained to be done on the physical plant, and in coming years, curves would be straightened, grades would be leveled, and new river bridges and freight yards would be built. None of this might have happened without the confidence that the *Rockets* engendered in the financial community.

After the first *Rockets* were in operation, new services were instituted between Kansas City and Dallas, Chicago and Denver/Colorado Springs, Memphis and Amarillo, and St. Louis and Minneapolis. All were remarkable for their own unique quirks.

The stage was set for K.C.-Dallas service when the Burlington-Rock Island assigned a second *Zephyr* trainset to the Fort Worth-Houston market in November 1938. Headed by shovel-nose unit 9902, the train had been built for *Twin Cities Zephyr* service and then served as the Kansas City-St. Louis *Ozark State Zephyr* before going to Texas. Upon 9902's diversion to Texas, the former *Texas Rocket* train was assigned to the K.C.-Dallas run, opposite the set that had been running from Kansas City to Oklahoma City since February.

In a bizarre twist, CB&Q locomotive 9902 kept the *Texas Rocket* name on its rectangular nose logo, not the familiar BURLINGTON ROUTE lettering.

The *Rocky Mountain Rocket* was the first train to deviate from the abbreviated consist of the originals. Drawn in its earliest days by a single 2000 h.p. E3A (No. 625 or 626), the non-articulated, 7-car consists included the first sleeping cars in *Rocket* service. Each consist made a daily one-way trip on the 1073-mile route.

Each consist had an 8-section, 2-double-bedroom, 2-compartment car for service between Chicago and Colorado Springs, and a 10-section, 4-roomette car for the Denver section. In addition, the round-end observation-lounge car had 5 double bedrooms. The sleepers and obs cars were built by Pullman-Standard, the others by Budd.

The Colorado train was also noteworthy for a 1940 motive-power experiment unique to the Rock Island—the AB6. Essentially an E6B unit with a cab, baggage compartment, steam generator, and only one engine, it was intended to handle the Colorado Springs section. In that infancy of dieseldom, it seemed like a good concept: two units to handle the combined sections from Chicago to Limon, Colo., where they'd split. Although the train would run regularly with the AB6 (later, as middle unit of three powering a longer train), in practice, the switching maneuvers necessary at Limon to get the Colorado Springs cars behind the AB6 weren't really any simpler than the alternatives. The only thing the experiment saved was a little wind resistance and the smooth appearance of a B unit behind the leading A unit on the portion of the trip east of Limon.

Nevertheless, the *Rocky Mountain Rocket* was a success, turning a $90,000 annual deficit on earlier trains into a $289,000 profit. Rock Island had heavy competition in the Chicago-Denver market, from the Burlington and

WILLIAM MOEDINGER JR.

After inaugurating its sixth *Rocket*, between Denver (above) and Kansas City, RI diverted the second train intended for the run to Texas. The resulting tri-weekly schedule didn't build ridership, and the service died after four months. The train migrated to a K.C.-Oklahoma City run, and later in 1938 was joined by the former Houston train to provide daily Kansas City-Dallas service. Oklahoma City, now off the *Rocket* route, was served by a motor-car shuttle to El Reno, where it is shown (right) with the northbound *Rocket* and a Memphis-Tucumcari train. In July 1948, motor car 9090 (lettered THE ROCKET) left Oklahoma City at 2:55 p.m. (below right) for El Reno, towing a through coach for Dallas.

C. A. EMRY

PRESTON GEORGE

Union Pacific. Each offered 16-hour streamliners years before the *Rocky Mountain Rocket* was introduced in November 1939, but the Rock was competitive again in terms of equipment if not schedule.

In addition, the *Rocket* was the only way to get from Chicago to Colorado Springs without changing trains, important to the well-heeled clientele who patronized the Broadmoor and other Springs-area resorts. As John D. Farrington later observed, "Prior to the establishment of this service, we had practically lost all our business to Colorado . . . we have recaptured our standing as a Colorado line."

The next *Rocket* to enter service was the *Choctaw Rocket*, in November 1940 between Memphis and Amarillo. It sported a Pullman-built consist of a coach, an 8-section, 5-bedroom sleeper, and a dining-observation car. A lone E6 usually held down the daily run in each direction on the 762-mile route.

The *Choctaw*'s coaches were interesting. The Jim Crow era is usually associated with heavyweight cars, but the *Choctaw* had "separate but equal" facilities in a streamlined package: two vestibules, two sets of restrooms, and two seating areas with a partition in between. If something can be both beautiful and ugly at the same time, these cars qualified.

The prewar era ended for the *Rockets* the same way it began, in another collaboration with the Burlington Route. In January 1941, the *Zephyr*

L. O. MERRILL

RONALD P. BOARDMAN

The *Rocky Mountain Rocket*, powered by an E6A-AB6 duo (top, westbound at Bureau, Ill.), were the first *Rockets* to exceed 4 cars. A unique AB6 booster unit handled the Limon-Colorado Springs section (right, leaving the Springs in February 1949). The observation car (above, being washed at Rio Grande's yard) was on the Denver section.

Rocket entered service between St. Louis and Minneapolis on a 14-hour overnight schedule. Northward, the Burlington handled the train as far as its namesake Iowa city, and the Rock Island took it from there, via Cedar Rapids and Waterloo to Minneapolis.

Unlike the earlier Texas collaboration, however, the two railroads didn't supply complete trainsets for the service. Rather, each contributed to a pool of cars, and the resulting consists were thus a mongrelized combination. Heavyweight sleeping cars were included, too, although they had been modernized with air-conditioning, rolled roofs, and underbody skirting. Still, the overall appearance of the train didn't approach the elegance of either a *Zephyr* or a *Rocket*. It would be a harbinger of change.

STATUS QUO NO MORE

The planes of Pearl Harbor torpedoed Rock Island's little streamliners just as surely as they sunk the ships in Hawaii. Wartime traffic swelled far beyond the trains' modest capacity, which left the Rock, like most other roads, scrambling for solutions. The *Rocket* consists were sometimes broken up, often re-assigned, and frequently augmented with different equipment. The TA's became troublesome, too—their 1200 horses weren't enough for bigger trains, their multiple-unit capability with other locomo-

IRA H. EIGSTI

ROBERT A. HADLEY

BEN F. CUTLER PHOTO; ROBERT A. LE MASSENA COLLECTION

The westbound *Choctaw Rocket* loads at the joint RI-Katy station in McAlester, Okla., in 1949 (top), and the overnight *Zephyr Rocket* pulls into St. Paul (above).

tives proved problematic, and their front draft gear was insufficient to pull a trailing load while running in reverse. The original *Rocket* equipment served in many assignments systemwide for more than 20 years, but the concept of designing locomotives for specific consists had been lost. Such trains simply proved too inflexible.

Before the war, though, the *Rockets* did exactly what they were designed to do, both on the road and in their employer's profit-and-loss statements. On the eve of America's entry into World War II, Ned Durham and John Farrington were called to testify before yet another reorganization hearing. (It wasn't the first and it wouldn't be the last—legal wrangling kept the company in bankruptcy until 1948.) "Our results have been most satisfactory," Farrington said, and Durham agreed, citing a return of nearly 40 percent on the first six trainsets since 1937.

In nearly two hours of testimony, Farrington rattled off an impressive litany of statistics for the reborn Rock Island: everything from the productivity of track gangs to the savings for roller-bearing-equipped steam locomotives to the cost of future improvements. He even knew the crop yields for various regions of the Rock's empire—year by year. It was a *tour de force*, not only of his knowledge, but of his understanding and vision.

It was not to last. Farrington became president upon Ned Durham's retirement in 1942 and retired himself in 1956. Farrington's tenure at the helm coincided with the Rock's best years. That's not to suggest his successors were less competent—the estimable Downing Jenks followed him as president—but it is to say that even Farrington's improvements weren't enough, in the end, to save the Rock Island.

The company was a prisoner of several factors. The vagaries of farming were omnipresent, of course, but other granger roads survived because they had more diverse traffic and generated more of it on-line. The Rock Island reached the hearts of too many big cities via trackage rights, thus limiting access to urban shippers. As a result, RI's non-agricultural tonnage was largely bridge traffic, which put it at the mercy of friendly connections. The company was ever the victim of its history, as when it built southwest to Leavenworth, Kan., instead of Kansas City, or bypassed Oklahoma City on its north-south route in favor of El Reno, Okla. Even Farrington and Jenks couldn't play such a hand forever.

In its death throes, the company was the subject of an agonizing 10-year struggle to merge with Union Pacific. By the time the ICC approved, as one wag put it, "the bride had lost her looks," and UP withdrew its petition. Meanwhile, the Rock had slid into bankruptcy for a third and final time, and it finally ceased operations in 1980. It was the biggest abandonment in U.S. railroad history up to that time.

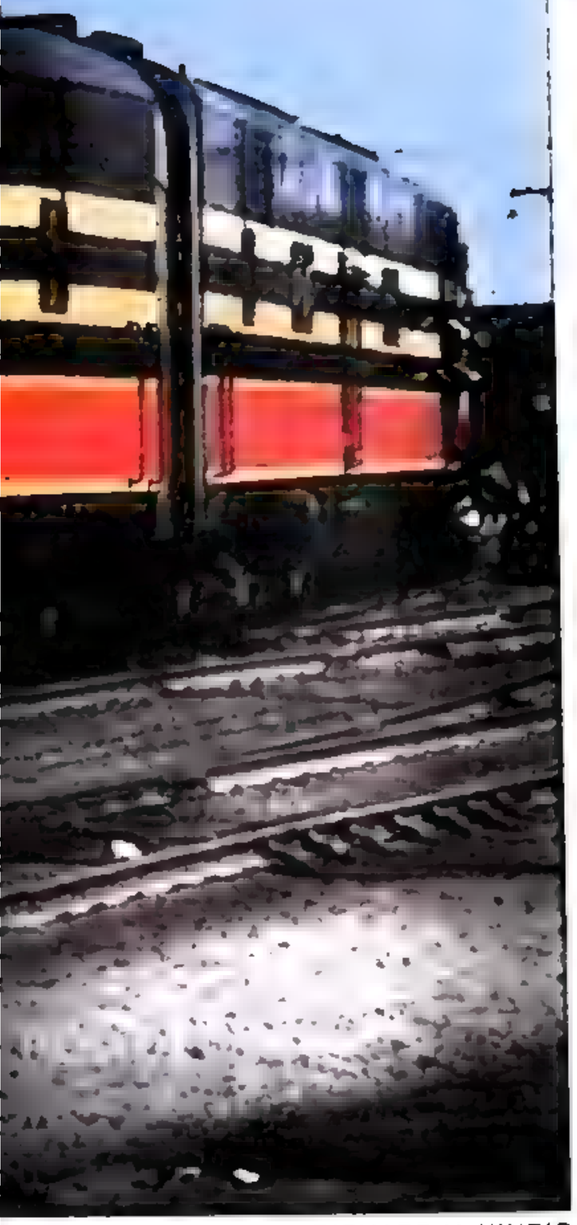
The *Rockets* weren't the first of the prewar streamliners, and others drew a more celebrated clientele. But no other carrier of the era started with so little and achieved so much. Rock Island came from hard luck, and to hard luck it returned. But in between, its *Rockets* reached for the stars. ■

POWER FOR THE PANAMA: As a major coal-hauler, Illinois Central kept steam longer than most roads—at least on freight. But IC knew what was best for passengers, buying five E6's in 1940-41. The first, No. 4000, wore a unique "bow-wave" livery to match the cars of the every-third-day *City of Miami.* The other four worked IC's crack *Panama Limited* at first, and here are two in New Orleans on October 3, 1943.

B&O THE PIONEER: Baltimore & Ohio, America's first railroad, was out front in passenger diesels, too. It was the first customer for EMC's 1800 h.p. boxcab of 1935, and got the first E units, 12 EA's and EB's in '37. B&O didn't have the first E6's (or the most—that was Atlantic Coast Line, with 27), but its 15 looked sharp in their Otto Kuhler-designed livery. E6A 57, an E6B, and an EA are at Jersey City on September 4, 1950.

Streamliner

SNAPSHOTS



RICHARD H. KINDIG

Electro-Motive's E6 diesel

JOHN DZIOBKO

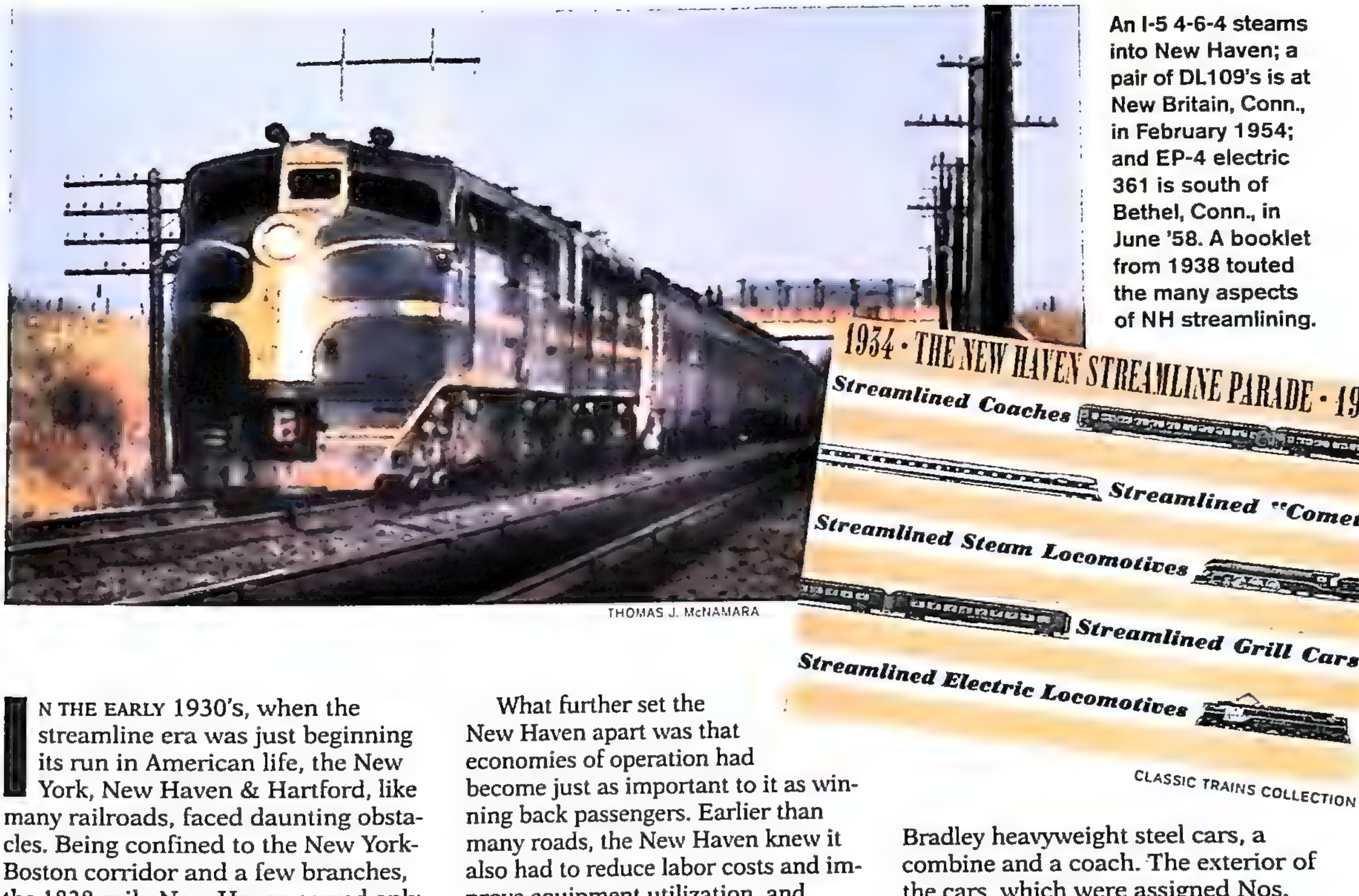
STREAMLINER STANDARD: If diesels were the power of choice for most streamliners, the E6 became the model of choice. During 1939-42, Electro-Motive built 118 of them in A and B versions for 14 roads —totals that topped those for all the other pre-war E models combined. At Miami on June 24, 1960, Florida East Coast No. 1005 (once lettered for the *Florida Special*) and a mate are ready to head north.

EDWARD THEISINGER

Streamlining *to save* solvency

The passenger-dependent New Haven knew it had to reduce labor costs and improve equipment utilization to stay afloat, and gave it a good try through streamlining

BY GEOFFREY H. DOUGHTY



THOMAS J. McNAMARA

CLASSIC TRAINS COLLECTION

An I-5 4-6-4 steams into New Haven; a pair of DL109's is at New Britain, Conn., in February 1954; and EP-4 electric 361 is south of Bethel, Conn., in June '58. A booklet from 1938 touted the many aspects of NH streamlining.

IN THE EARLY 1930's, when the streamline era was just beginning its run in American life, the New York, New Haven & Hartford, like many railroads, faced daunting obstacles. Being confined to the New York-Boston corridor and a few branches, the 1838-mile New Haven served only four states, albeit an area containing 10 percent of the nation's population.

The railroad was heavily dependent on passenger traffic, with two-thirds of its train-miles in such service. Half its riders were commuters. Despite its small physical size, though, the New Haven ranked fourth in passenger revenues, behind giants Pennsylvania, New York Central, and Santa Fe. Although still in the black, with the tough economy, the New Haven could see insolvency looming.

Throughout the land, highways were being improved and the public was shifting away from public transportation. New Haven's ridership was slowly eroding, as the development of U.S. 1 parallel to NH's main route, the "Shore Line," was making its presence felt. If the railroad was to retain its dominant position in the region's economy, it would have to move fast. The New Haven did just that, choosing streamlining as a tool to set it on a course of modernization and attract travelers back to the rails. Other railroads would also take this approach, of course, but the New Haven was one of the first, and it was active on all fronts, fielding streamlined motor trains; passenger cars; and steam, diesel, and electric locomotives.

What further set the New Haven apart was that economies of operation had become just as important to it as winning back passengers. Earlier than many roads, the New Haven knew it also had to reduce labor costs and improve equipment utilization, and streamlining was the course it chose.

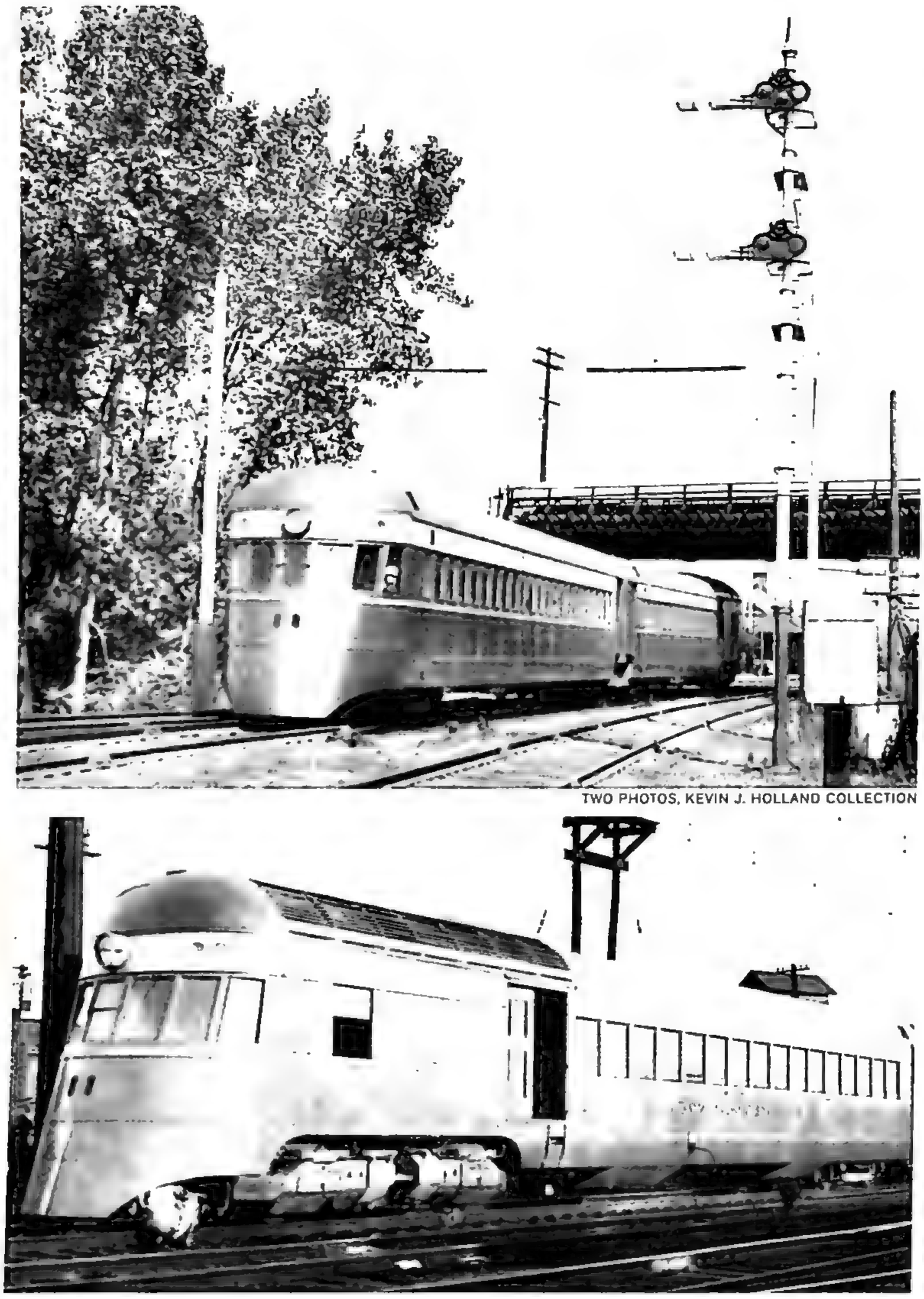
THE STEAM EXPERIMENT

New Haven entered the streamline era, at least philosophically, in 1934 when it was approached by two brothers, George D. and William J. Besler. They were promoting their Besler Steam Train, a proposed two-car streamlined, bi-directional train with a passenger seating capacity of about 150. It incorporated a small baggage space and was designed to replace short trains that usually consisted of a steam locomotive, a baggage car, and a couple of coaches.

The Besler invention incorporated a high-pressure steam power plant consisting of a boiler and condensers, plus control equipment located in operating compartments at either end of specially built cars. This design had the advantage of providing the required amount of power with less weight and expense than would be required for a diesel-electric. As a self-contained train, it would have lower operating costs than a traditional locomotive-drawn train, as well as reduced terminal expenses.

New Haven gave it a try, turning to the Budd Company to build the train from two of the railroad's Osgood Bradley heavyweight steel cars, a combine and a coach. The exterior of the cars, which were assigned Nos. 9210-9211, was altered to give an appearance comparable to the NH's streamlined coaches it was ordering from what by then was the Pullman Osgood Bradley plant in Worcester, Mass. (The Osgood Bradley Car Co., which built its first railroad coach in 1833, had come under control of Standard Steel Car Co., which was acquired by the Pullman Company in 1929; Pullman retained that name for its operating division, while its car-building division became the Pullman-

J. W. SWANBERG PHOTO



TWO PHOTOS, KEVIN J. HOLLAND COLLECTION

The "business end" of the 1936 Besler Steam Train (above) is in 64-seat car 9210, at the far end in the view (top) of it handling Waterbury-Bridgeport train 443 at Derby, Conn., on September 6, 1940.

Standard Car Manufacturing Co.)

Budd replaced the cars' clerestory roofs with a lower, rounded type. In the power car, an eight-foot long section at one end was reserved for installation of the Besler boiler plant and auxiliary equipment. Behind this was a 12-foot baggage compartment. The truck under the boiler end of the power car was replaced by the Besler power truck.

Budd applied a frontal design that resembled the *Zephyr*, which the company had built for the Burlington Route. An operator's compartment, with the necessary control apparatus, was placed in each streamlined end.

The train rolled out of Budd's Philadelphia plant in early fall 1936 and entered revenue service between Bridgeport and Hartford (via Waterbury), Conn., that October. It had a top speed of 70 mph.

The Besler Steam Train was not a complete success, owing to sporadic mechanical difficulties and its frequent inability to maintain schedule. It ran in service for only seven years, being withdrawn in 1943, but it was not scrapped. Rather, the New Haven recycled the cars, converting them to their original, nonpowered configurations and returning them to service.

COMET: A UNIQUE PIONEER

Meantime, a little blue-and-silver motor train called the *Comet* was the New Haven's first true, long-lasting plunge into streamlining. Designed for the Boston-Providence (R.I.) market and delivered on April 27, 1935, it was the carrier's first train to successfully address both equipment utilization and operating-cost reduction. It was built by America's Goodyear Zeppelin Co. of Akron, Ohio, and Germany's Zeppelin Gesellschaft, manufacturer of the "lighter-than-air" dirigibles, and the amalgamation produced a train of unique character. (The affiliation also explains why Goodyear Tire & Rubber Corp. has long flown ceremonial blimps in the U.S.).

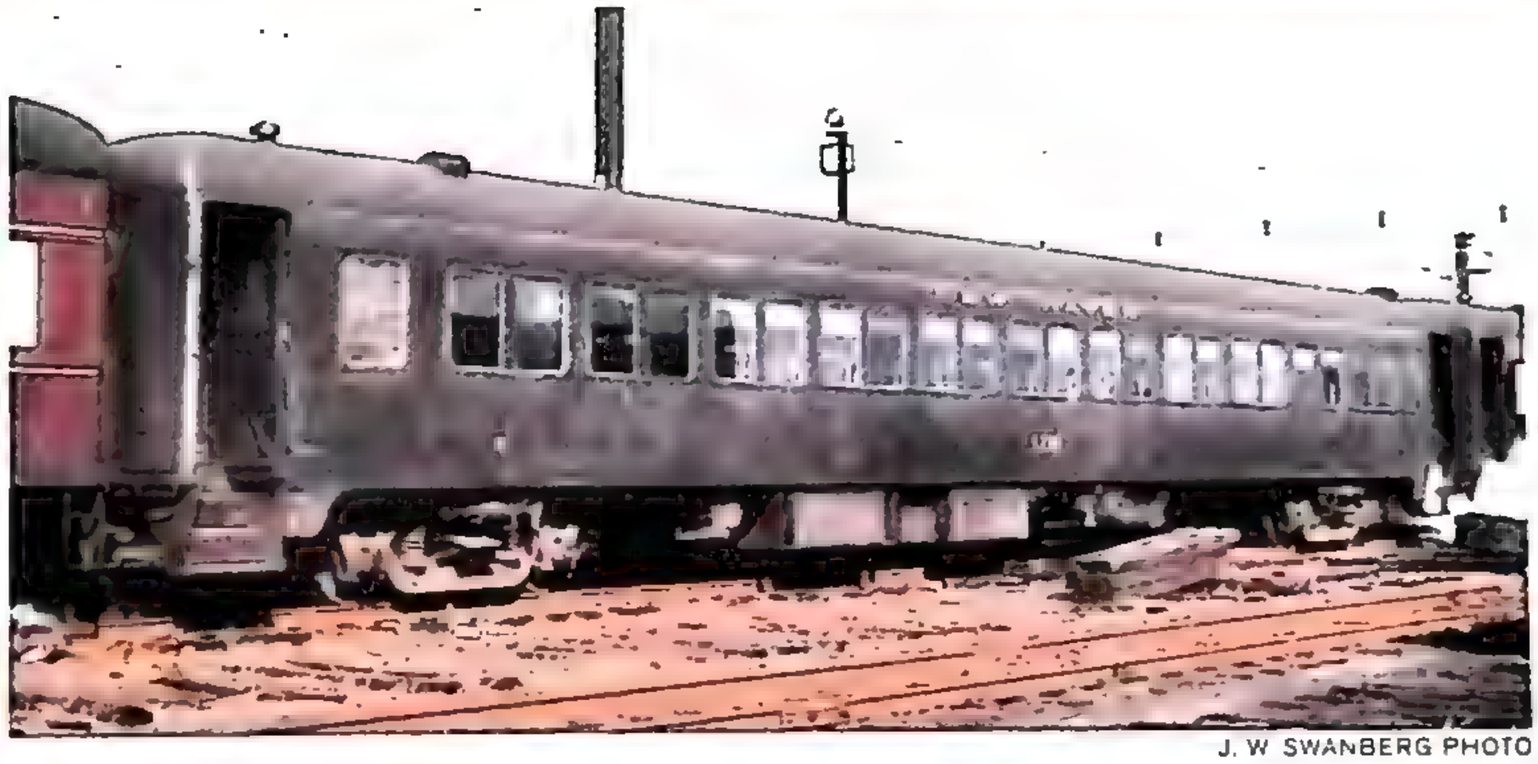
An important design feature of the *Comet* was that it, like the Besler train, was double-ended, reducing turnaround time and operating costs. Unlike the Besler train, but following lightweight motor-train practice of the time, the *Comet*'s three cars were articulated. Articulation eliminated the expense of switching cars, and reduced weight and friction. This lowered maintenance costs and improved ride quality. Just as important, the *Comet*'s futuristic styling would attract a public intrigued with modern, streamline design. And its diesel power plant to provide smooth, clean, high-speed operation.

The *Comet* was specifically intended to compete with steam-hauled trains in corridor service. With a cruising speed of 90 mph and a maximum of 110, it was powered by two 400 h.p. diesel engines and generators designed and built by Westinghouse. The complete train, with a power car at each end and a coach in the middle, was only 207 feet long; it weighed 253,300 pounds, carried on four trucks.

Each end unit had an engine room and a passenger compartment seating 48 persons; there was no provision for mail or baggage accommodation. The center car had a 36-passenger seating section and a 28-person smoking compartment. With total seating capacity capped at 160, its ability to adapt to spikes in demand, like that of all articulated trains, was limited.

The *Comet* was made of an aluminum alloy featuring a natural appearance of the metal. Unlike the *Zephyrs*, which had stainless-steel fluting, the New Haven train's exterior was treated

HARRY R. LANGE PHOTO, J.W. SWANBERG COLLECTION



J. W. SWANBERG PHOTO

This very rare color photo of the *Comet*, believed taken at Waterbury, Conn., shows off its bright blue and silver livery. By February 22, 1970, when "American Flyer" coach 8312 rested at New Haven (right), the car had put in 3½ decades of service.

with a "whorled" finish. The *Comet* possessed an aerodynamically smooth body shell that combined a low profile with flush windows and a smooth, covered underside.

After several weeks on an exhibition tour, it entered service on June 5, 1935, making five round trips between Boston and Providence six days a week.

BANKING ON THE "FLYERS"

Concurrent with its decision in 1934 to purchase the two-car Besler train, New Haven placed an order with Pullman-Standard for 50 deluxe 84-seat coaches of a streamlined design. Thus, while the giants of the industry were acquiring articulated trainsets or only just waking up to streamlining, the New Haven was amassing a fleet of modern, comfortable, and *flexible* single-unit cars.

In collaboration with Pullman-Standard, the New Haven had engaged noted industrial designer Walter Dorwin Teague to design the cars, the first of which was delivered in December 1934. They were among the first of their type to use Cor-Ten steel, a United States Steel product that was a mixture of carbon steel with traces of copper, chromium, silicon, and phosphorous.

Cor-Ten's attributes were that it was inexpensive; four to six times more corrosion-resistant than carbon steel; and, although lighter, had a greater high-tensile strength than carbon steel. The result was a car that weighed about 17 tons less than a comparable one of traditional design. As such, these cars were dubbed "lightweights" when compared with their "heavyweight" counterparts. Following the New Haven experience, Pullman-Standard chose Cor-Ten as the primary material in most of its subsequent lightweight cars.

"De Luxe Travel in Streamlined Coaches at No Extra Cost," boomed NH's advertising for its new cars. "Not only air-conditioned, but streamlined! Built of new alloy steel . . . rugged, almost tubular, modernistic yet sane," continued the ads' fine print. "Hugging the ground nine inches lower, these cars speed over the rails with every bump and noise removed by rubber-padded integral wheel trucks. Smooth-surfaced even to rounded aluminum frames on their double, non-fog, soundproof windows, these coaches [are] the last word in modern, safe, luxuriously comfortable travel."

The new cars were 84 feet, 6¼ inches long over the buffers, 13 feet, 4 inches from the top of the roof to the rail, and 10 feet, one-quarter inch wide; they weighed about 100,000 pounds. Featuring a tubular cross-section design, they utilized small rivets that did not break up the smooth appearance of the cars' exteriors. Like the *Comet*, they were aerodynamically clean, without overhanging eaves or protruding belt rails.

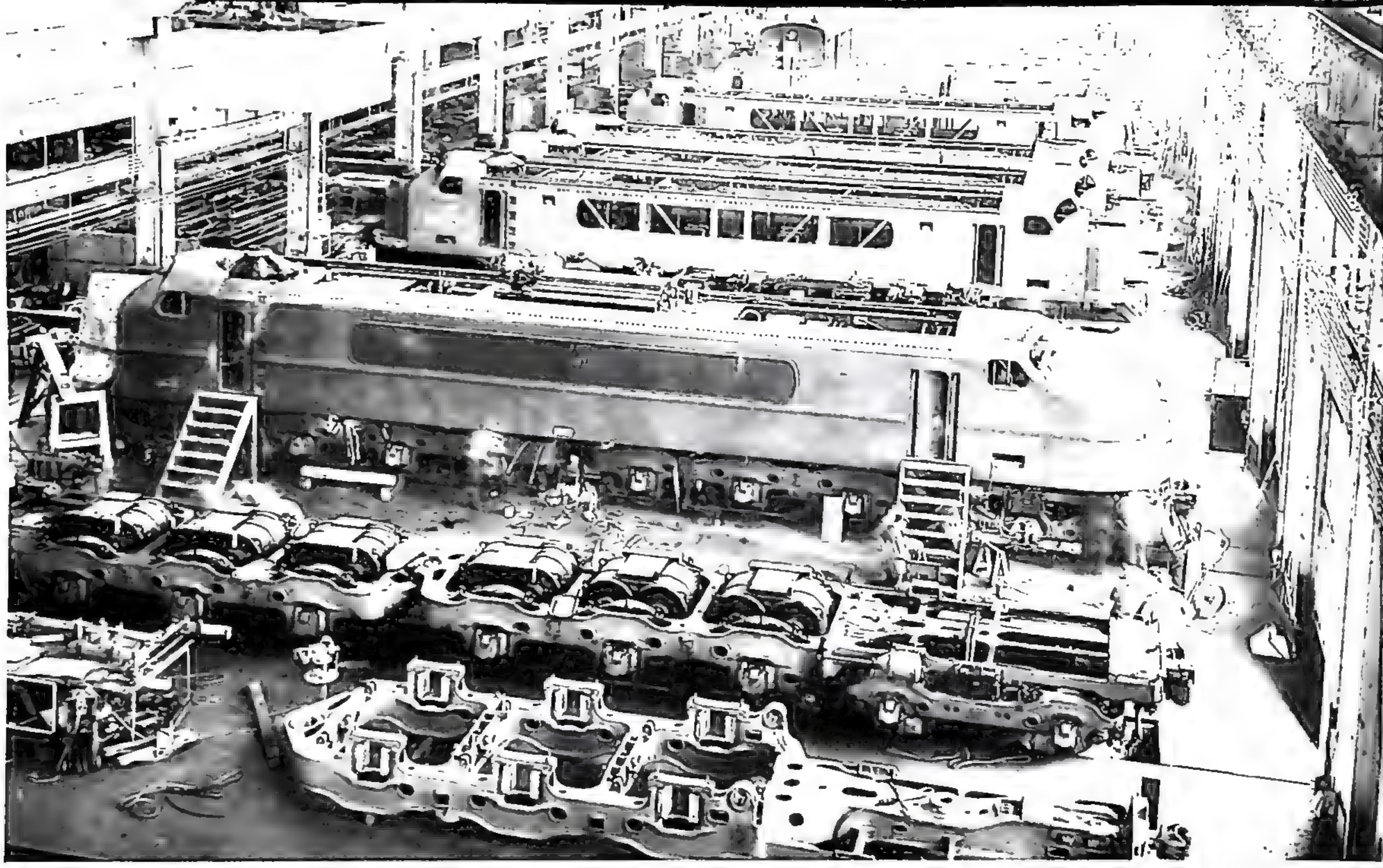
The doors and the large windows were as flush with the sides of the car as possible, and the roofs were rounded, including at the ends. A skirt extended below the side sills and between the steps of the car, with a slight inward curve of the sides, which not only improved airflow but also gave the coach a lower and more streamlined appearance. Pullman-Standard built similar coaches for New Haven's New England neighbors Boston & Maine and Bangor & Aroostook, and for roads elsewhere such as Cotton Belt, Kansas City Southern, Lehigh Valley, and Seaboard Air Line.

Why the nickname? The cars came to be widely called "American Flyer" cars because they were popularized by toy trains of the same style in the American Flyer catalog of toymaking giant A. C. Gilbert, which was located in New Haven.

The New Haven ordered 150 more such cars during 1935-38, 100 of which had an increased seating capacity of 92, including an extra window on each side. In addition, NH took delivery of 5 grill-cafeteria cars of this style in August 1937. While many of New Haven's first-class trains still operated with heavyweight cars, the 205 cars of this lightweight, streamlined design set a standard for the future.

STYLE FOR THREE MODES

In the mid-1930's, New Haven's aging fleet of steam and electric locomotives was in need of augmentation and replacement with motive power capable of pulling the standard coach-



GENERAL ELECTR C

Five of NH's EP-4 electrics are on the assembly floor of Building 10 at GE's Erie, Pa., works on St. Patrick's Day 1938.

es and Pullmans that made up most of its passenger trains. The Pullmans weighed up to 80 tons each and required a locomotive that could handle the Shore Line's many curves, speed restrictions, and acceleration requirements.

So, in 1936, New Haven asked the Baldwin Locomotive Works to build 10 4-6-4's. The road's top steam passenger power, 50 class I-4 Pacifics built in 1916, were not up to the task and were wearing out. The new engines would be classed I-5 and have 80-inch driving wheels. Delivered between February and May 1937, they were numbered 1400-1409 and could haul 13-car trains with ease on the existing schedules. In keeping with the times, the I-5's were streamlined, but not overly so. Their skyline casings, conical noses, and sheet-metal trim gave a sleek appearance but left all moving parts exposed. The I-5's were among the first engines streamlined upon their construction, and they kept their styling until retirement in 1951.

The New Haven shared a lot of characteristics with its two big New York neighbors, New York Central and Pennsy. New Haven's intercity trains went to both Grand Central Terminal and Penn Station, the latter for trains, and cars, bound for beyond Gotham to Washington, D.C., and points south. New Haven also shared with NYC and PRR the characteristic of being electrified in the New York area; NH finished wiring its New York-New Haven main line in 1914.

Along with ordering the 4-6-4's for New Haven-Boston, the New Haven contracted for new electric locomotives from General Electric. Classed EP-4, numbered 0361-0366, and weighing 432,000 pounds each, they entered serviced in June 1938. With a 2-C+C-2 wheel arrangement, they could develop 3600 continuous horsepower and 7600 peak horsepower. They were geared for 93 mph, so their ability to accelerate could not be challenged by any single locomotive then in service on the New Haven. Though mechanically similar to the box-cab EP-3's of 1931, the EP-4's presented a radically new appearance. Their welded carbodies, painted Hunter green with gold trim, had smooth, diesel-type noses with cast New Haven script emblems.

Ten very similar EF-4 class locomotives, numbered 0150-0159, arrived in 1942-43, five each from Westinghouse and GE. Geared for 65 mph, they were designed primarily for freight service, but could be modified for passenger work. This the New Haven did, to Nos. 0150-0154, in 1944 by adding steam boilers.

DUAL-SERVICE DIESELS

By 1940, New Haven had to look away from the wires again. Its 10 Baldwin I-5 4-6-4's had displayed wheel-balance problems, and were operating under speed restrictions. New Haven's Philip Hatch, who had guided his employer into the diesel era with switchers and the *Comet*, was instrumental in helping the road, in collaboration with its favored locomotive supplier, Alco, to develop a remedy. What they came up with was a new idea: a dual-purpose road diesel.

Following Electro-Motive's lead, Alco had come out with a streamlined passenger diesel, designated DL-103b, with two turbocharged 1000 h.p. 538 engines within an Otto Kuhler-styled carbody. Rock Island got the first (and only) one, in January 1940, before the change was made to 539 engines (with the same rating). Two more similar locomotives, of designations DL105 and DL107, were delivered, to the Rock Island, before the rest of the type came out as DL109's.

New Haven wanted a locomotive that could roll passenger trains by day and haul freight by night. Could Alco's offering do so? Yes, thanks to the DL109's freight-size traction motors and heavy-duty draft gear. New Haven took 10 to begin with, the first arriving on December 13, 1941, and wound up getting 50 more throughout the World War II years, the largest DL109 fleet

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The I-5's—that's 1405 flying west (top) on an extra near Branford, Conn.—eventually had wheel-balance problems, so NH asked Alco for diesels that would perform equally well on varnish and tonnage. Sixty DL109's did the trick. Delivered in two shades of green, some were repainted orange (the freight above has one of each), but most would wind up appearing like 0755 (left, on Massachusetts' Old Colony line in July '57).

by far. Numbered in the 0700-series, and geared for 80 mph, they shuttled between New Haven and Boston on varnish, and over to Maybrook, N.Y., and elsewhere on tonnage.

The first 50 DL109's were delivered in Pullman green with gold striping; the last 10 came painted Hunter green with a silver-gray nose panel and pinstripes, but they were eventually repainted to match the first 50. New Haven's DL's would be complemented by 27 postwar PA's, but some DL's, and EP-4 electrics as well, lasted into 1961 when new EMD diesel-electric/electric FL9's took over. (At least one DL109 would be repainted in the latter-day "McGinnis" red, white, and black.)

The ultimate testimony to the DL109's success: New Haven never ordered another steam locomotive after the I-5's.

Meantime, the railroad's pioneering *Comet* soon had to be reassigned from its original Boston-Providence schedule of five round trips six days a week —its popularity was exceeding its capacity. Shuffled off to branch-line service, the train lasted through the 1940's, making its last run on September 29, 1951.

While the New Haven's streamlined equipment was not the equal in volume of such roads as New York Central, Pennsylvania, Burlington, and Santa Fe, whose flashy long-distance fleets garnered headlines and the public's attention, the southern New England carrier quietly went about its chores with a fleet of modern, streamlined equipment designed for the travel demands of its patrons. For its relative size, the New Haven could be justifiably proud. ■

The simultaneous streamlining of the top trains in the East was a mix of collaboration and competition

BY KARL ZIMMERMANN

EDMUND M. SPIEKER

ROBERT A. LE MASSENA

20th Century and Broadway:

Tangled rivals

HEAD-TO-HEAD, SIDE-BY-SIDE: Central J-3a 5449 and Pennsy K4s 3768 come together at the 1939 New York World's Fair. NYC's *Century* and PRR's *Broadway* stopped beside each other at Englewood, Ill.

EDMUND M. SPIEKER

NEW YORK CENTRAL

"THE STANDARD Railroad of the World," the Pennsylvania called itself. Arch-competitor New York Central used the self-applied moniker "America's Greatest Railroad."

Though both the Pennsylvania and the New York Central were vast Eastern systems, with route maps resembling overlaid spider webs, the showcase passenger route for each was the one linking the nation's two largest cities, New York and Chicago. Mark the date of June 15, 1902, when their rivalry began its ascent to a summit. On that day, the Central placed the luxurious *20th Century Limited* in overnight New York-Chicago service, and the Pennsy inaugurated the *Pennsylvania Special* in competition. Both were all-first-class trains.

Both ran on the same fast schedule, 20 hours end-to-end. PRR's mileage via Pittsburgh was 908, 53 miles shorter than NYC's 961 via Buffalo, but PRR had the Allegheny Mountains to cross, which NYC's "Water Level Route" did not. In 1912 the PRR train's name was changed to *Broadway Limited*—first rendered as *"Broad Way,"* because it was named for the railroad's multi-track main line, not the famous avenue in Manhattan.

Three and a half decades after launching their top trains, PRR and NYC, riding the wave of streamliner enthusiasm of the mid-1930's, began planning their own lightweight trains, but they took different approaches. Central would focus initially only on its illustrious flagship, the *20th Century*. Pennsy, on the other hand, planned an entire "Fleet of Modernism," streamlining not only the *Broadway* but also the Washington-Chicago *Liberty Limited*, the New York-St. Louis *"Spirit of St. Louis,"* and the New York-Chicago *General*.

TWO GREAT DESIGNERS

Both railroads employed noted industrial designers who had worked with them previously. Pennsy's man was Raymond Loewy, and Central's was Henry Dreyfuss; both would design numerous everyday items familiar to millions of Americans.

Loewy, born in Paris, on November 5, 1893, had moved to the U.S. immediately after World War I. He first worked as a fashion illustrator before becoming an industrial designer and launching what he called "a one-man crusade under the aegis of good taste." His first major commission came in 1929, when he was hired to remodel the Gestetner duplicator, a kind of mimeograph machine. Although his initial project for the PRR was glamorless—designing trash cans for New York's Pennsylvania Station—his second, in 1935, was to style the splendid GG1 electric locomotive.

By Loewy's own assessment, this was a highlight of his career, which numbered thousands of projects for hundreds of clients. His designs included the Sears Coldspot refrigerator, the Studebaker Starliner and Avanti, Greyhound's Scenicruiser, and Frigidaire appliances, plus a variety of famous logotypes: Lucky Strike, Shell, United States Postal Service, and Exxon. Raymond Loewy Associates would become the largest industrial design firm in the world. Said noted architect Philip Johnson, "Raymond started industrial design and the streamlined movement."

In 1949 Loewy was on the cover of *Time* magazine ("Designer Raymond Loewy: He Streamlines the Sales Curve"). *Life*, for its Bicentennial issue in 1976, chose Loewy's opening of his design studio in 1929 as one of "The 100 Events That Shaped America."

When Henry Dreyfuss was born in Manhattan, on March 2, 1904, NYC's *20th Century Limited* was not yet two years old. At New York's Ethical Culture School, where he received a scholarship, he studied with stage designer Norman Bel Geddes—and, he would say later, gained a concern for people and for their comfort in their environments. Bel Geddes would become one of the early giants of industrial design, and Dreyfuss would fol-

HALSMA'

PENNSYLVANIA

PUBLICITY POSES: In third-rail territory where electrics normally powered the train, J-3a 5455 stands with a *Century* consist. A retouched photo purporting to show the new *Broadway* includes K4s 3768 and a solid train of lightweight cars.

low him as an apprentice in theater design and then into the new profession. Dreyfuss hung out his shingle as an industrial designer in 1929, the same year as Loewy.

Dreyfuss's many enduring creations include the Big Ben alarm clock for Westclox, the round thermostat for Honeywell, John Deere tractors, the classic desk set and later Slimline telephones for Bell Laboratories, Hoover vacuum cleaners, and Polaroid cameras. Dreyfuss styled the interiors for two American Export ocean liners launched in 1951: the *Constitution* and the *Independence*. Dreyfuss's first work for the NYC was on the *Mercury*, a day train (between Detroit and Cleveland, initially) inaugurated on July 15, 1936. This distinctive nine-car train was crafted in the railroad's Beech Grove (Ind.) Shops from surplus commuter coaches built in 1927. In 1951, Dreyfuss's portrait adorned the cover of *Forbes* magazine ("Designer Dreyfuss: Simply Genius").

I met Raymond Loewy in 1976 in his stylish Manhattan office, a later version of one that had been an exhibit at the Museum of Modern Art in New York. There we discussed the GG1 and the Pennsylvania's 1938 Fleet of Modernism—including the *Broadway Limited*—which he styled for the railroad. I asked him how the train compared to Dreyfuss's *20th Century*.

"Henry has been suspected of being color-blind," Loewy said, without smiling or winking. "I don't know if it's true or not, but everything he designed at the time was dark gray or dark brown." Catty or cogent, this comment does illuminate one of the big differences between the two designers' aesthetically quite different trains. Loewy went on to talk about his.

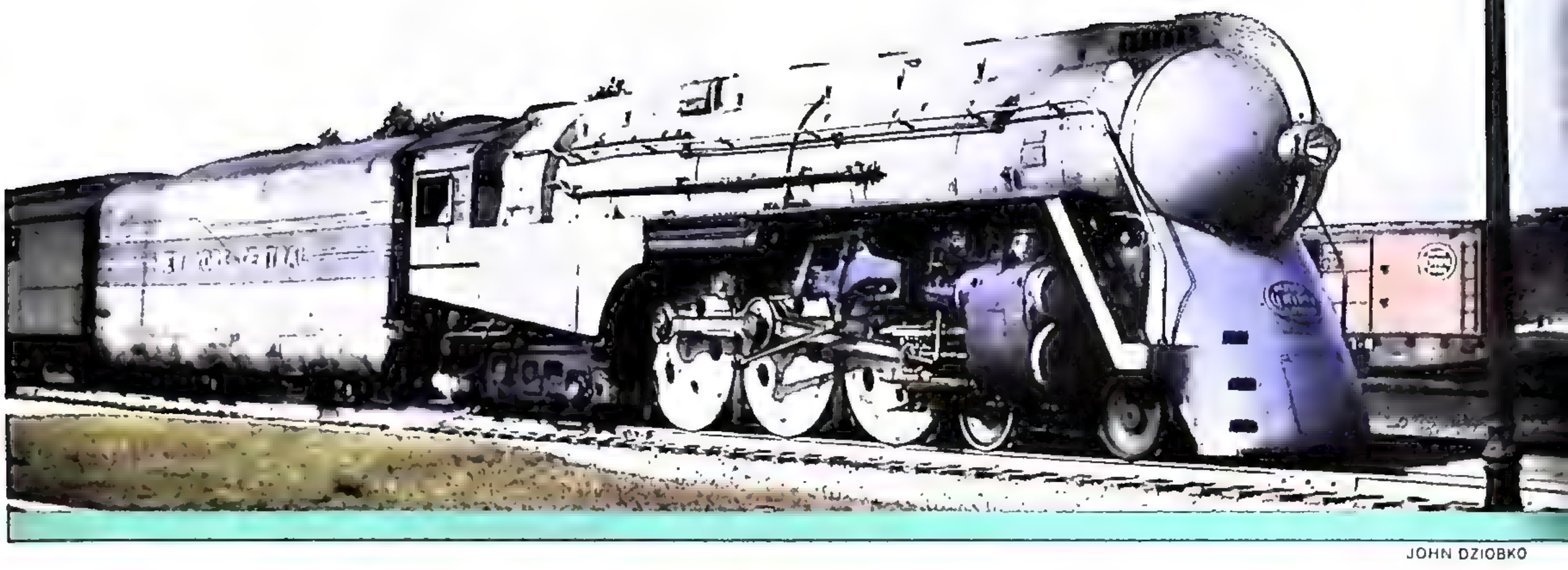
"I'd recently done some very successful ships [for the Panama Line], which were decorated in brilliant colors, very gay, with high-density lighting, lots of foot-candle-power, very cheerful—cheerful is the word," he said. "So I made the *Broadway Limited* a cheerful train. There were whites and oranges and lemons, with touches of black as accents, but very cheerful. That was the difference between the two."

HAGLEY MUSEUM & LIBRARY

DESIGNERS: Henry Dreyfuss gave the *Century* its look of cool elegance. Raymond Loewy (seen with the PRR 6-4-4-6 he styled) was a more flamboyant figure.

THE FIFTH PARTNER

The stories of the 1938 versions of the *Broadway Limited* and *20th Century Limited*, then, are a delicious tangle—a tale of rivalries and partnerships, of entities working together and at cross purposes, and not always in the ways you might expect. In addition to the PRR and Raymond Loewy Associates, and the NYC and Henry Dreyfuss & Associates, there was a fifth and very significant partner: Pullman-Standard, the carbuilding arm of Pullman, Inc. Virtually by default, it would



JOHN DZIOBKO

LOCOMOTIVES: Superb fin-fronted 4-6-4's like 5450 at Englewood were the standard power for the *Century*. Nonstreamlined 4-6-2's were the norm on the *Broadway* west of Harrisburg, but east of there, graceful GG1 electrics did the honors; 4905 is on a lesser train at North Philly.

build most of the cars for the trains. This company's centrality in the projects lent them a collaborative air.

This was misleading. Or was it? Planning for the new trains began in earnest in 1936. Four years before that, worn down by the Depression, Pennsy and Central had agreed to collaborate in eliminating such amenities as club cars and observation cars on most of their trains to hold down costs. If one railroad didn't offer them, the other wouldn't need to, either. Now, as the details of the streamlined *20th Century* and the Fleet of Modernism were evolving, all five entities—two railroads, two design firms, one builder—worked together on one committee.

Each of the five, though, had somewhat different agendas and objectives. Pullman saw cooperation as a way to ensure standardization, that great enhancer of the builder's bottom line. The last thing Pullman wanted was for any railroad to demand expensive special features or configurations as the firm was establishing the norms for its then-new lightweight, streamlined cars. Sitting on the other side of the table, PRR and NYC hoped that the collaboration would keep Pullman from using their rivalry to leverage better operating contracts, since Pullman's operating division ("the Pullman Company") would operate the sleeping cars that P-S built.

If the Pullman people were wary of the railroads and their potential demands, they were twice as leery of the designers. The carbuilder made it crystal clear that it saw Loewy's and Dreyfuss's roles essentially as interior decorators, dealing mainly with fabrics and finishes. Under no circumstances were they to start moving walls around, or make structural changes of any kind.

ANOTHER GREAT JUNE 15

Flash forward to June 15, 1938, when the new *Broadway* and *Century* were poised to debut. They would depart from Chicago and New York on a schedule just reduced to 16 hours, and would write illustrious new chapters in two already great histories. These are the trains that stood at Chicago's La Salle Street Station and New York's Grand Central Terminal (the *20th Century*) and Chicago Union Station and New York's Pennsylvania Station (the *Broadway*). Both broke new ground in being all-room trains; not only were no coaches carried, but old-fashioned open-section sleepers were banned as well.

Pennsy's inaugural westbound *Broadway*, first among (nearly) equals in the Fleet of Modernism, numbered 11 cars that could accommodate 99 passengers. Straight Pullmans came in three types: 18-roomette cars in the *City* series; 4-compartment, 2-drawing-room, 4-double-bedroom cars in the *Imperial* series; and 13-double-bedroom cars in the *County* series.

The *Century*'s inaugural westbound run, in contrast, operated in two sections (the first with 10 cars, the second with 15) accommodating a total of 225 passengers, more than twice the *Broadway*'s capacity. This discrepancy had been typical in the heavyweight

NEW YORK CENTRAL

KRAMBLES-PETERSON ARCHIVE

era, and it would hold in the early streamlined era as well. "Standard Railroad of the World" or not, the PRR routinely played second fiddle to the NYC when it came to New York-Chicago passenger carriage.

New York Central ordered 62 cars to re-equip its *Century*, which allowed the operation of two sections when demand warranted. On the other hand, the Pennsylvania chose to largely re-equip four trains using 52 new cars and some rebuilt heavyweights. Lightweight cars for the balance of Central's "Great Steel Fleet"—a term that antedated streamlining—would have to wait. In fact, the *New England States*, a new Boston-Chicago service (also launched on June 15, 1938) to replace the Boston section of the *Century*, was initially a heavyweight train.

The *Century*'s sleeping cars were much akin to the *Broadway*'s, reflecting the standardization Pullman coveted. The *Century*'s roomette cars were also named in the *City* series, but contained only 17 rooms rather than 18. This was because, in the center of the car where roomette 9 would have been, there was a lengthwise sofa and an upper berth for the porter. Roomettes were a novelty at the time, and although the beds in these accommodations were meant to be lowered into place by the passengers themselves, some preferred to have help from the porter. No doubt the sofa was a place for them to wait while he "made down" their roomettes.

The roomette was a key feature of both trains, since by replacing the open section it gave them all-room status. In typical one-upmanship, each railroad claimed a first—which was true, sort of. "First all-room train in America," announced Central. "The *Broadway Limited* now departs as a magnificent all-room train," trumpeted Pennsy, "the first in history." The *Century*'s elegant inaugural booklet had this to say about the roomette, words that could have applied equally to this accommodation on the *Broadway*: "The roomette is the most recent innovation in train sleeping quarters. Within the same space as the old section is now found an enchanting private room, procurable at section cost. Tasteful, livable, and spacious, it includes disappearing toilet facilities, clothes lockers, adjustable foot rest, and in-a-wall bed." The roomette concept was so new, in fact, that during the summer of 1937, NYC and PRR had both tested *Roomette I*, a Pullman demonstrator car.

Like the *Broadway*, the *Century* had 4-compartment, 4-double-bedroom, 2-drawing-room cars, also named in the *Imperial* series, and 13-double-bedroom *County*-series cars. However, *Century* consists included an additional car type: 10-roomette, 5-double-bedroom cars in the *Cascade* series.

Other than the different color palettes—Loewy's bright hues, Dreyfuss's cool colors—the sleeping cars could essentially have operated in a pool, which is just what Pullman wanted. That the two roads had gone to Pullman-Standard for their trains was just what Pullman wanted, too—and enforced, as vigorously and as long as it could. In 1936, Burlington with its *Denver Zephyr* and Santa Fe

PENNSYLVANIA

INTERIORS: Gun-metal columns punctuated the middle lounge section of the *Century's* observation cars. The *Broadway's* mid-train lounge cars had a typical Loewy feature: walls without windows.

GENERAL ELECTRIC

COMPROMISE: In the New York electrified zone, box-cabs dressed in utilitarian black pulled the *Century*. PRR distributed its new cars among several trains and had but one fully streamlined Pacific, so at a glance the *Broadway* might not look much different from lesser lights like the *American*.

with its *Super Chief* had "stepped out of line" and equipped their trains with Budd-built sleeping cars. The Pullman Company fought back, threatening those two railroads and other potential mavericks with cancellation of operating contracts. Not until Pullman, Inc. (parent to P-S and the Pullman Company) lost an antitrust suit in 1944 were Budd and other builders free to compete in the sleeping-car market.

GLORIOUS FEATURE CARS

So for their 1938 trains, NYC and PRR inevitably went to P-S—and knuckled under to the builder's demand for standardization in the sleepers. No doubt of necessity, Pullman was more open to the suggestions of the railroads and their hired designers when it came to the "feature" cars—the diners and lounges—and it is in those cars that some glorious differences in the aesthetics of the two trains occurred.

For the *Century*, in each of potentially two consists in each direction, this meant a buffet-lounge with a barber shop and a crew dormitory that ran at the head of the train, right behind the baggage-mail car; a mid-train dining car (or two, depending on train length); and an observation-lounge car with a double bedroom and a master room.

The four *Century* observation cars —*Bedloes Island*, *Manhattan Island*, *Pelee Island*, *Thousand Islands*—were quintessentially Henry Dreyfuss. "Cleanlining" was a word he liked to use to describe his work, and the cars perfectly expressed that aesthetic. They were spare, even stark. They were coolly elegant. As the brochure had it, the main middle lounge section was a "stunning room with its narrow gun-metal columns and blue leather couches against captivating gray leather walls." In summary, the overall effect was "a striking scheme of conservative modernism."

For many, though, the place to be in an *Island* car was the solarium in the rounded observation end, where rear-facing semicircular settees offered fine views of the receding track. On the bulkhead was a speedometer, once an obligatory "obs-car" fixture. Two of the cars had pictorial maps of the New York Central system; the other two had models of the Dreyfuss-styled J-3a streamlined Hudsons that powered the *Century* west of Harmon, N.Y., the end of the electrification from Grand Central Terminal.

The *Island* cars' master room was, of course, the premier accommodation on board, with two windows and four movable club chairs—for entertaining, no doubt, since the master room was designed for just two people. Accordingly, it made down at night with just two lower berths. The room featured a shower and a radio, and a door opened into the adjacent double bedroom, creating a suite.

At the front of each consist was another lounge: *Century Club*, *Century Inn*, *Century Lounge*, or *Century Tavern*. Going back to the heavyweight era, these forward cars typically were male preserves, often described as smoking lounges. Accordingly, these buffet-lounges housed the barber shop. Also stationed there was the train secretary, who could help passengers with correspondence, telegraph Pullman for return reservations, and expedite receipt or dispatch of telegrams generally. He could also provide a dictaphone for use anywhere on the train.

The lounge area had a casual, clubby ambiance, with curved settees arranged maze-like, breaking up the tunnel feel that has traditionally presented the sternest challenge to designers of railroad-car interiors.

Dreyfuss again wrestled with this problem—again successfully—in creating the *Century*'s splendid dining cars. Here there were six built (Nos. 680-685) on the assumption, no doubt, that when the train ran in two sections, one section would be short enough that a single diner would suffice. These cars were the heaviest (they rode on six-wheel trucks rather than four-wheel) and most expensive in the consist, costing $92,000 apiece compared with an average of $78,000

R. J. FOSTER

for the sleepers. Unlike the sleepers, these diners (and the baggage-RPO's) were owned by NYC, not Pullman.

The *Century*'s dining cars had a pair of unique features. Typically the cars were run in pairs, with their dining areas adjacent. Thanks to windows in the car ends, patrons could look from one car into the other, sensing an abundance of space. When a diner ran alone, mirrors dropped down to cover the windows, creating the illusion of spaciousness in another way. The cars' other special feature was convertibility—from restaurant to nightclub. After dinner in "Café Century," rust-colored linen replaced white on the tables, and the car's lights, in fixtures specially designed by Dreyfuss, were switched from white to rosy. A radio or phonograph played swing music, and passengers could definitely get "in the mood."

That these diners could plausibly serve as nightclubs was testimony to the designer's successful attack on the look of lockstep tables that had been nearly universal in diners up to that point—either 12 tables for four (seating 48) or the slightly roomier 6 of four and 6 of two (seating 36). Clear plastic partitions separated four four-seat "dinettes" at the car ends from the main section, which had curved four-seat banquettes located catty-corner; adjacent small tables could be moved in place to create seating for five, a dining-car rarity. There were tables for two—some with side-by-side seating, some facing—and additional tables for four. This comfortable, varied arrangement provided seating for 38.

MORE COLOR, LESS VIEW

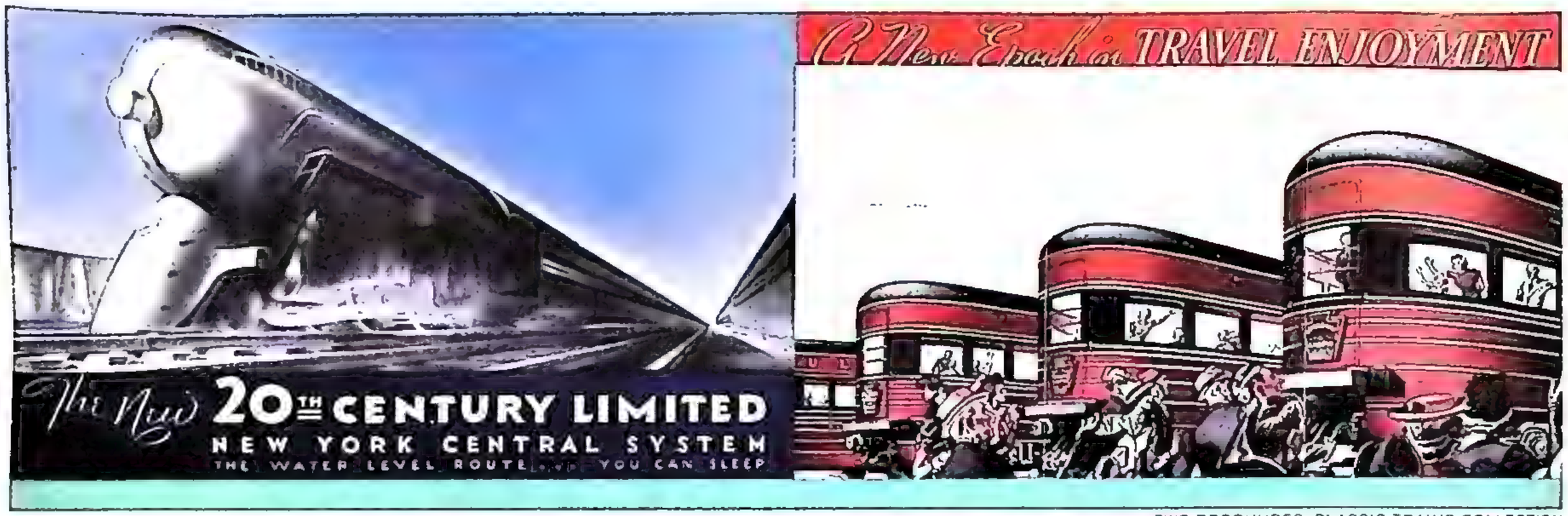
How did the feature cars of Loewy's *Broadway* compare? The two dining cars initially assigned to the train offer a clue to the *Broadway*'s subtly second-class status, because they were heavyweights dating from 1910, albeit substantially rebuilt in PRR's Altoona (Pa.) Shops. (Also heavyweight were the baggage-RPO—or, sometimes, two separate cars—and, apparently, a sleeping car run as a crew dormitory.) These cars received air-conditioning, and contoured roofs replaced their clerestory originals, so the rebuilds blended relatively well with the new P-S-built cars. All wore the elegant two-tone red dress with the gold pinstripes Loewy designed for the Fleet of Modernism. (Dreyfuss's cool livery for the *Century*, a blue-edged dark gray band on a background of lighter gray, with twin silver stripes at window level, was equally striking.)

In addition to the bright colors touted by Loewy, his *Broadway* diners were characterized by a surprising expanse of windowless wall space—in the center of the cars, which contained inward-facing banquettes. "Beyond carved glass paneling at one end," read a promotional brochure, "is a charming ante room where bright canary yellow side seats face two side tables opposite a handsome walnut bar." This section was also windowless.

Oddly, PRR did order a pair of new diners for one train of the Fleet of Modernism, the Washington-Chicago *Liberty Limited*. One of these Budd-built cars was given to Loewy for interior décor, the other to Paul Cret, who did a great deal of work for Budd. Although different, both treatments were generally attractive, and PRR soon ordered 15 additional new diners, evenly split among Budd, P-S, and American Car & Foundry. But in all these cars, styled by Loewy, the windowless center section was gone, a victim of passenger complaints about the *Broadway* and *Liberty* diners. (Until the arrival of these cars, the *"Spirit of St. Louis"* and the *General* had run with heavyweight diners.)

Decorated but windowless walls were part of Loewy's concept for both the mid-train and observation lounges as well. Although this might seem odd, remember that, except in summer, most of the *Broadway*'s journey was after dark—and the Pennsy had no scenic equivalent of the two-plus hours along the Hudson that ended the *Century*'s eastbound and began its westbound journeys.

The *Broadway*'s tail cars—2-master-room, 1-double-bedroom buffet-lounge-observations *Metropolitan View* and *Skyline View*—had an intimate 10-seat observation lounge all the way to the rear, and just ahead of that a 12-seat lounge, both cozy oval spaces made possible by giving up windows. Aboard the mid-train 2-double-bedroom bar-lounge cars (with barber



TWO BROCHURES, CLASSIC TRAINS COLLECTION

PROMOTION: In brochures, the Central touted its top train alone, while Pennsy pushed its entire "Fleet of Modernism."

shop and secretary's room), *Harbor Point* and *Harbor Springs*, passengers were even more thoroughly cut off from passing scenery. The 14-passenger lounge at one end of the car had no windows at all, while an even more intimate space with quarter-round bar had only one.

Of course, among the trains' largest details were the locomotives. For his *Century*, Dreyfuss created a magnificent streamlined design for 10 J-3a Hudsons, generally acclaimed as the high-water mark in steam-locomotive streamlining. Although Loewy shrouded a single K4s Pacific for the *Broadway*, standard K4's were the train's usual power. Under wire, however, between New York and Harrisburg, Pa., the peerless GG1's, styled by Loewy three years before the *Broadway*, were an elegant match for the train. (NYC assigned no special locomotives for its shorter Harmon-Grand Central electrified segment.)

Not only locomotives received attention, as both designers prided themselves on being involved in even the smallest details of their trains. Dreyfuss designed a triumphant logo for the *Century*, with 20TH CENTURY LIMITED stacked in clean sans-serif lettering over a series of horizontal bars. Against an illuminated blue background, this logo served as the observation-car tailsign from 1938 through the post-World War II re-equipping and right up to the train's last day in 1967. The logo appeared on dining-car china, menus, matchbooks, stationery, brochures, and all manner of publicity materials. It also appeared on the famous red carpet that was rolled out for departures.

Loewy never nailed a logo quite so perfectly. For a tailsign, he chose the *de riguer* Pennsylvania keystone embracing four tracks, a nice reference to the genesis of the train's name. (Carried for a time by the postwar observation cars *Mountain View* and *Tower View*, this tailsign was eventually replaced by a simpler, bolder one.) For the dining-car china, Loewy created a highly abstract pattern featuring a mirror-image "PR." Both designers took an interest in even such minutia as toothpick wrappers. ("From Toothpicks to Locomotives" is a chapter title from Loewy's entertaining memoir, *Never Leave Well Enough Alone*.) As an example of his hands-on involvement, Loewy had the *Broadway*'s dining-car linen tinted "coral sand" in the laundry at Manhattan's St. Regis Hotel. Regarded as something of a gourmet, Loewy had input on menu content as well as design.

LEGACIES OF THE LANDMARKS

Two landmark trains, two great railroads, two pre-eminent designers. How did it all end?

After being re-equipped following World War II, both trains eventually withered as part of the epidemic contagion that beset the nation's passenger trains in the 1960's. The *20th Century Limited* died outright on December 2, 1967. The *Broadway Limited* lingered on well into the Amtrak years, but in name only. In 1968 the New York Central and the Pennsylvania Railroad were merged into the infamous Penn Central, a disaster waiting to happen that all too soon did.

And Loewy and Dreyfuss? They were so different, one from the other —far more different, really, than the *Broadway* was from the *Century*. Loewy was tirelessly self-promotional and endlessly charming, his European stylishness and sophistication certainly a business asset. His retainer with the Pennsy was long-lasting, until 1952, and encompassed an extraordinary number and range of projects. The relationship could be contentious, with Loewy's freewheeling style (on billing matters and scope of authority as well as aesthetics) often exasperating the more conservative railroad men.

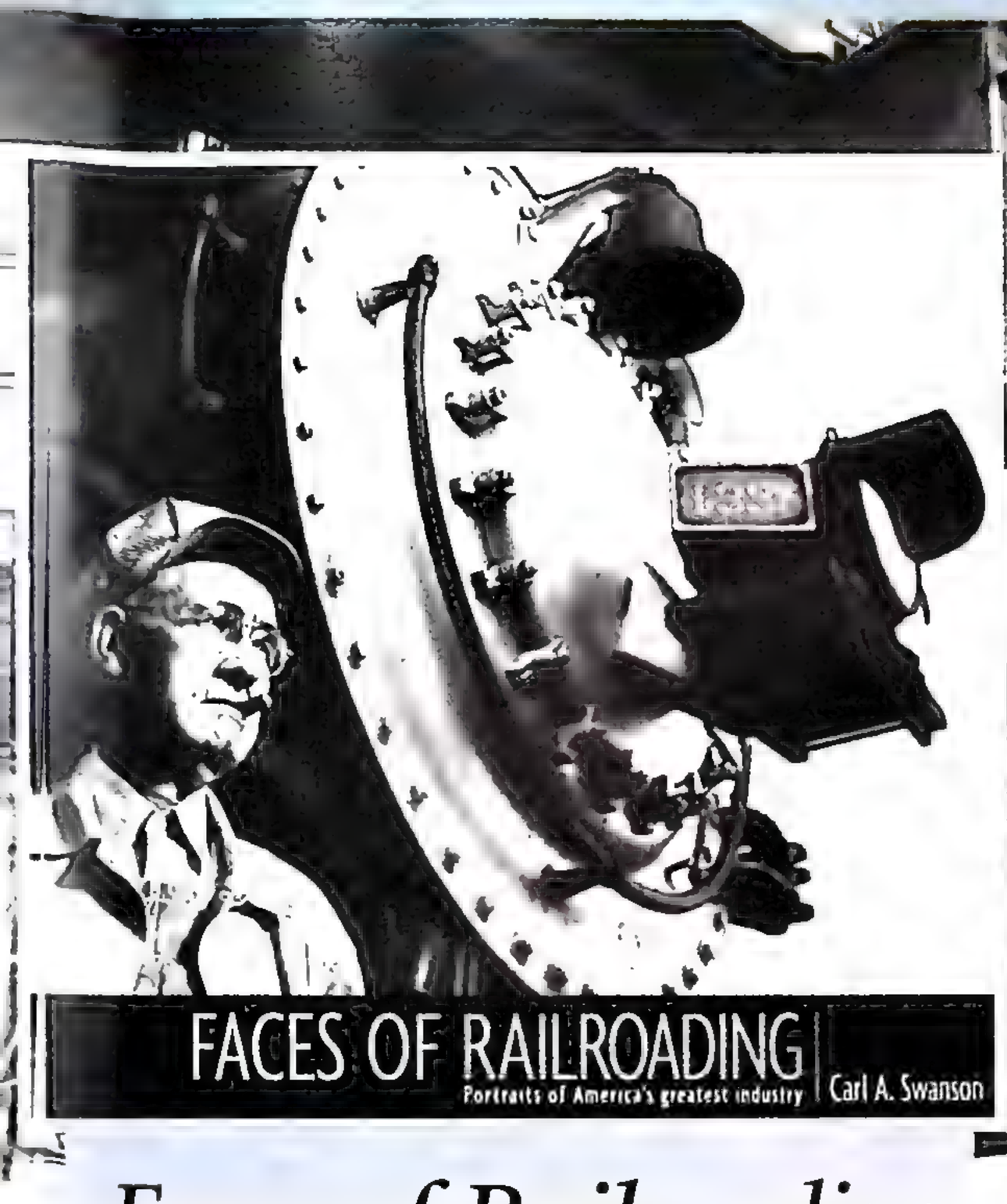
Loewy worked until late in his life, then slid into gentle retirement, living out his last years in a 16th-century manor house outside Paris and in St. Tropez with his wife, the glamorous Viola Erickson, 30 years his junior. He died on July 14, 1986—Bastille Day, the major holiday in France.

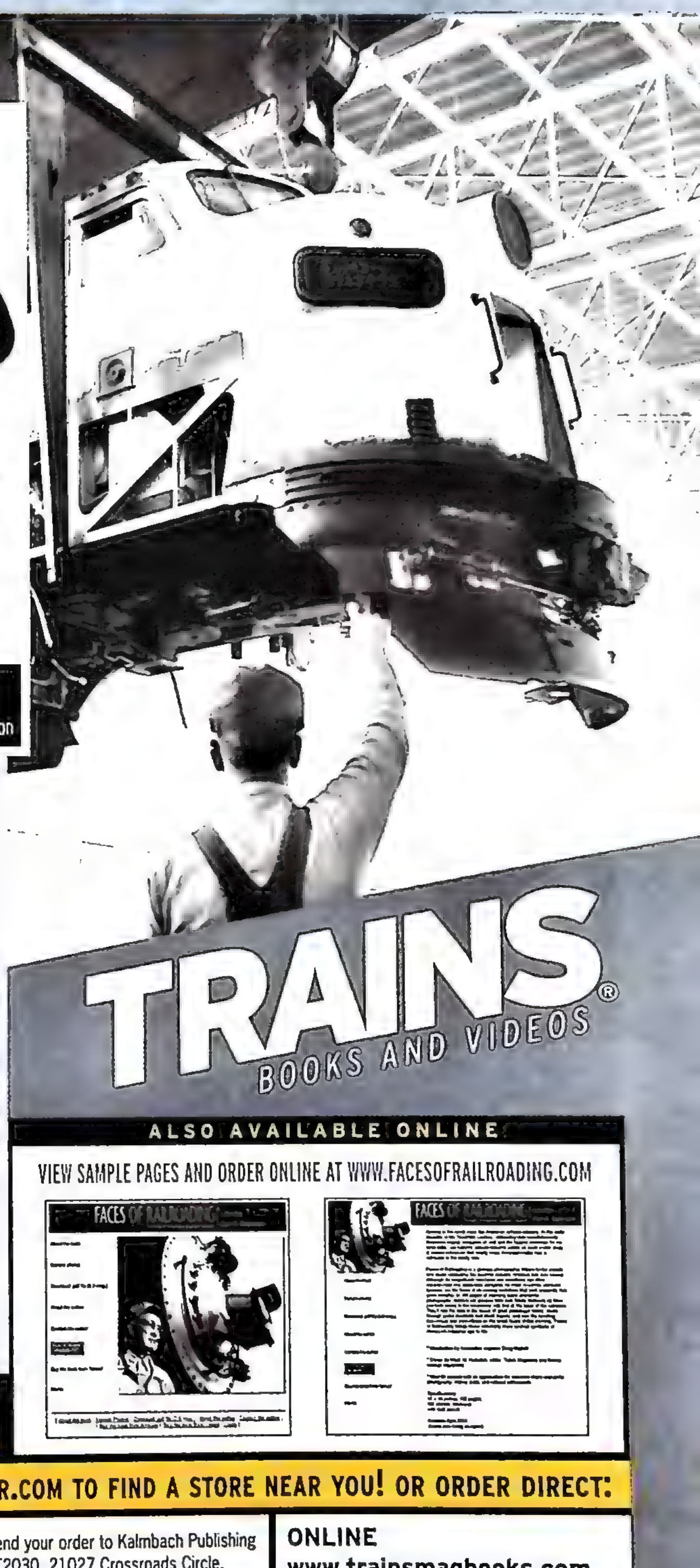
While Loewy was flamboyant, Dreyfuss projected a more serious demeanor, that of a student whose more restrained designs were driven by architect Louis Sullivan's famous axiom, "form follows function," to which he also subscribed. Long interested in ergonomics (how equipment relates to the user), Dreyfuss in 1959 published *The Measure of Man*, creating dimensions and characteristics for "typical Americans" Joe and Josephine. His retainer with the Central was lengthy and fruitful.

In 1928 Doris Marks had gone to work in Dreyfuss's office. Influential in convincing him to move from stage to industrial design, she managed the business side of his career from start to finish. They married in 1930. In 1972, she was diagnosed with inoperable liver cancer, and on October 5, Henry Dreyfuss and Doris Marks were found in their automobile, dead of carbon monoxide poisoning.

Two great men, greatly different. Two great trains, much alike yet each highly distinctive. Which was the greater? You decide. ■

MEET THE MEN WHO WORKED THE RAILS!





Faces of Railroading

Striking black and white photographs commemorate the unsung heroes of railroading during the Great Depression, World War II, and the Postwar industrial boom. Vintage shots – the gritty engineer at the throttle, the conductor waving from the caboose, the cross-country passenger riding in style and comfort – capture bygone scenes of everyday folks intersecting with the greatest industry America has ever known.

- **Compiled and written by *Model Railroader* senior editor Carl Swanson, graduate of West Virginia's Woodland School of Photography**
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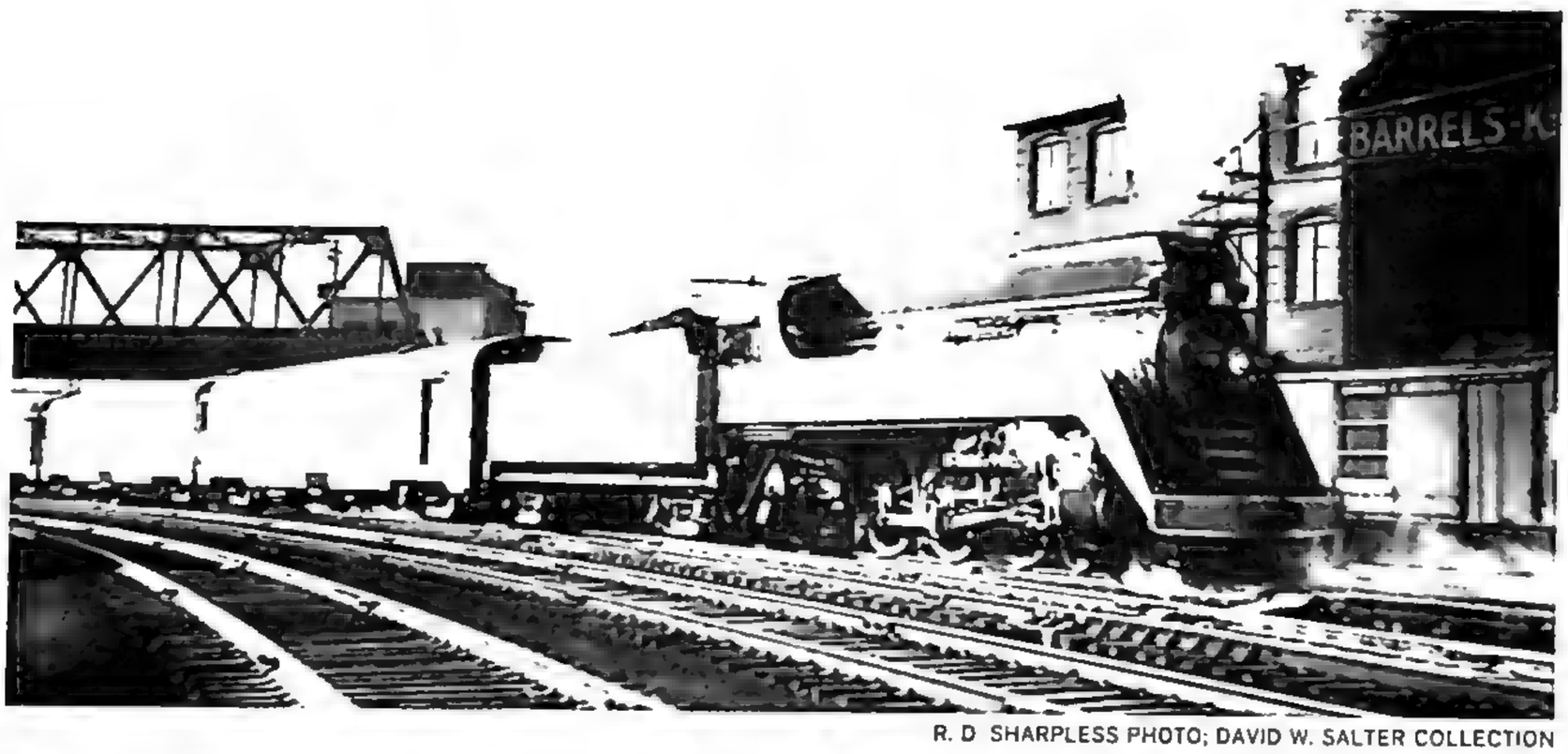
Streamliner SNAPSHOTS '5

Fast trains to Florida

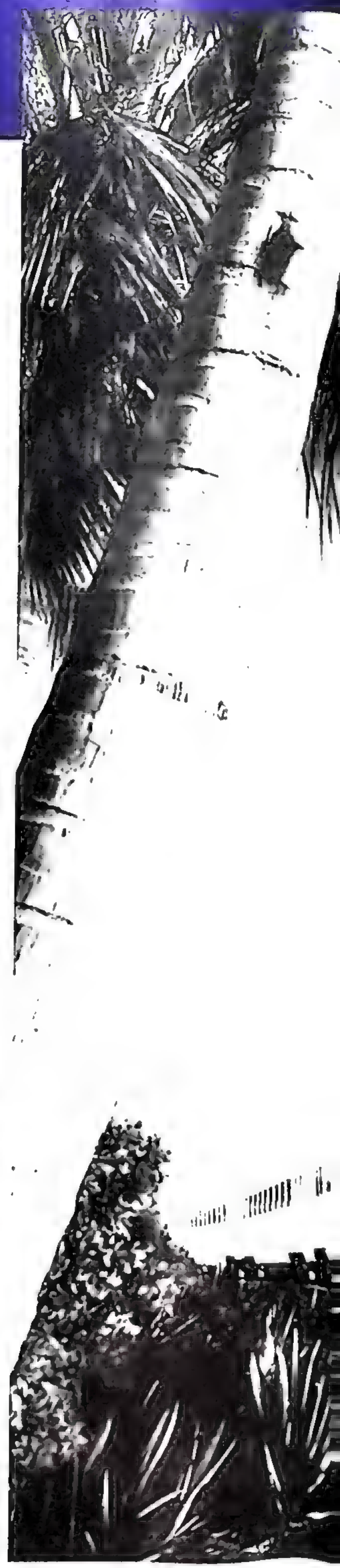


R. D SHARPLESS PHOTO; DAVID W. SALTER COLLECTION

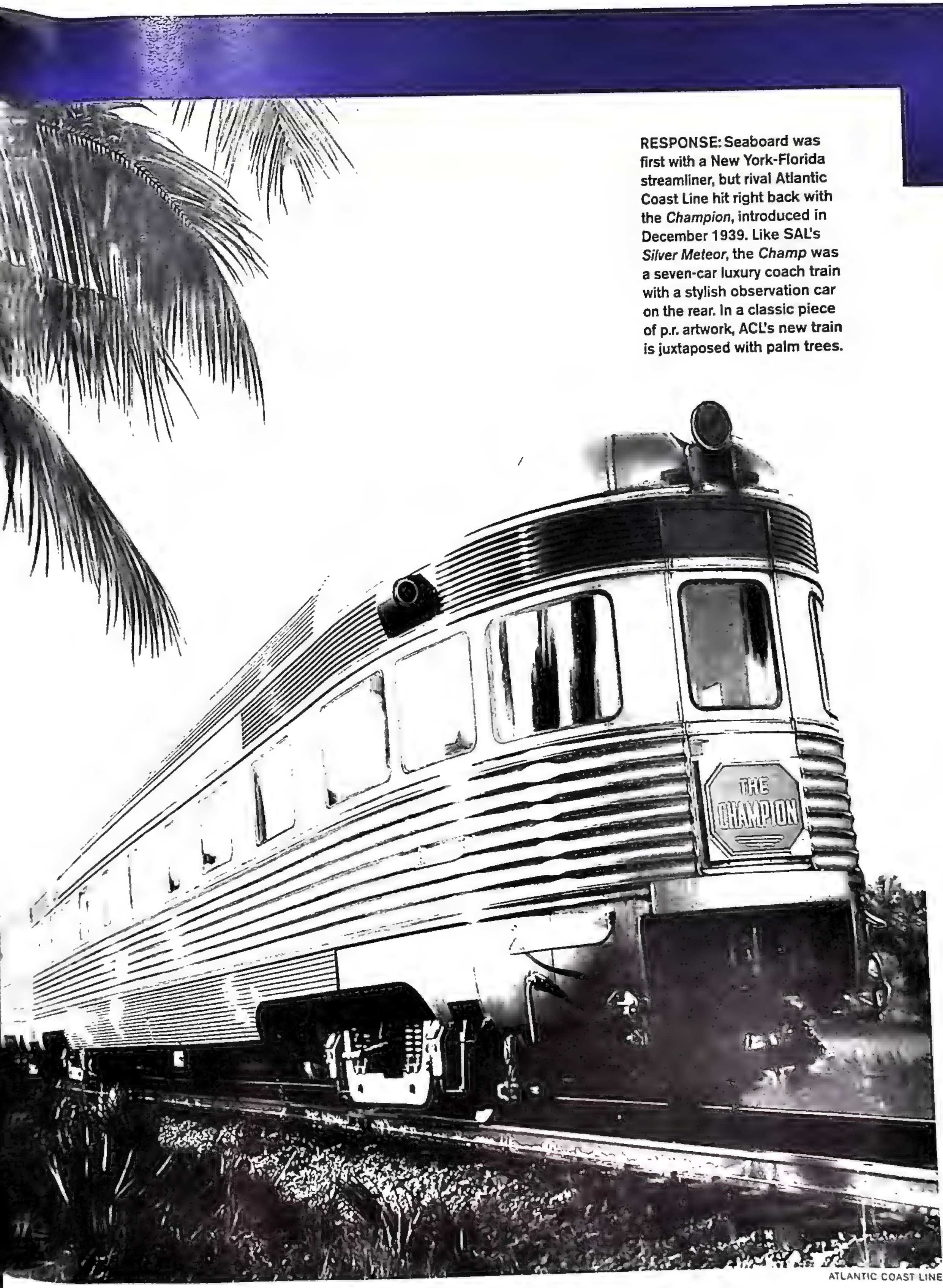
TEAMWORK: In late 1940, three streamliners—*Dixie Flagler*, *City of Miami,* and *South Wind*—entered Chicago-Miami service. Each ran every third day, over a different route. Of the nine railroads involved, perhaps the most unlikely member of the streamliner club was 640-mile Atlanta, Birmingham & Coast, which handled the *Dixie Flagler* Atlanta-Waycross, Ga., with jaunty 4-6-2 No. 79, seen at Bellwood tower, Atlanta.

G. W. PETTENGILL PHOTO, CHARLES K. MARSH JR. COLLECTION

DIESEL MEN: Electro-Motive representatives C. M. Larson (left) and J. F. Kelly relax at St. Petersburg, Fla., with their charge: Seaboard Air Line E4 3006, power for the brand-new *Silver Meteor*. The date is February 7, 1939, and the all-coach Budd streamliner is on its first visit from New York to St. Pete.



RESPONSE: Seaboard was first with a New York-Florida streamliner, but rival Atlantic Coast Line hit right back with the *Champion*, introduced in December 1939. Like SAL's *Silver Meteor*, the *Champ* was a seven-car luxury coach train with a stylish observation car on the rear. In a classic piece of p.r. artwork, ACL's new train is juxtaposed with palm trees.



ATLANTIC COAST LINE

The streamlined steam of

Otto Kuhler

Otto Kuhler (seen in the cab of a Mexican F unit in 1961) did some of his most memorable styling work for the Lehigh Valley. Less that a year after he streamlined her for the *Black Diamond*, Pacific 2093 waits for the train at Newark, N.J., on February 1, 1941. Kuhler's desire to retain the basic form of the steam engine is apparent in this design.

WHEN OTTO KUHLER sailed into New York harbor on May 10, 1923, his choice of ship—the liner S.S. *Pittsburgh*—could hardly have been more appropriate. Kuhler (pronounced CUE-ler) was born in Germany in July 1894 to a family with long ties to regional iron foundries, and he was exposed from an early age to heavy industry and railroads. Emerging artistic talent and the notion of someday having a hand in locomotive design prompted him, at age 12, to sketch an engine he had seen in Belgium and send the drawing to the machine's American builder, Samuel Vauclain of the Baldwin Locomotive Works. The Baldwin magnate responded with a personal letter of thanks and a catalog. Kuhler was that rare child destined to fulfill his youthful dreams, and Vauclain had planted seeds of encouragement not soon forgotten.

Bound, via New York, for his ship's

One of the earliest advocates of streamlining was also among the most prolific practitioners of the art

BY **KEVIN J. HOLLAND**

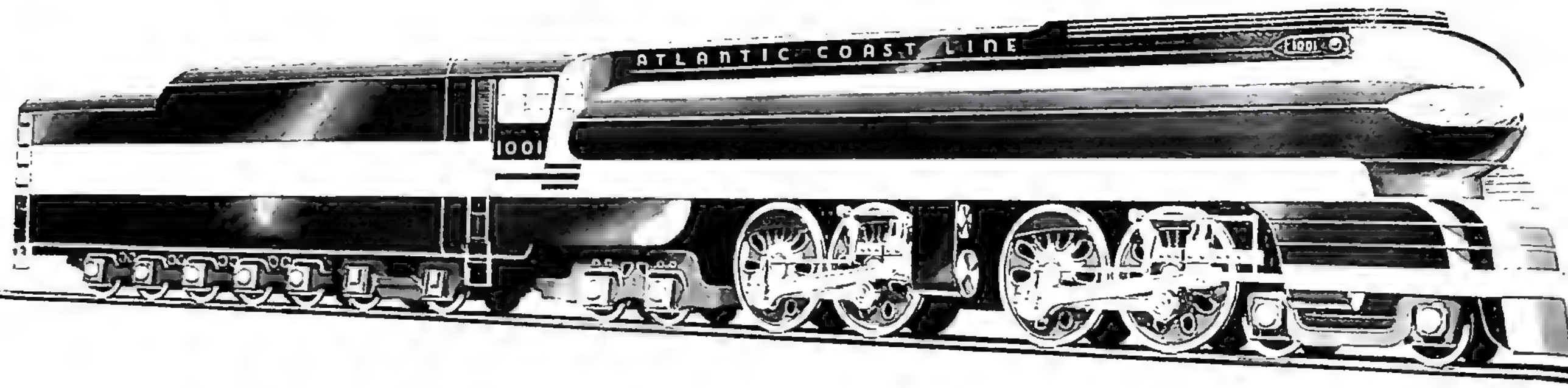
MAIN PHOTO, RICHARD H. KINDIG; INSET, COLORADO HISTORICAL SOCIETY COLLECTION

namesake, Kuhler came to the United States as a commercial artist with a fascination for America's industrial infrastructure. Pittsburgh's concentration of industry busied Kuhler with painting commissions and advertising work. Through one of his new clients, Kuhler was introduced to Robert Van Sant of Baltimore & Ohio's public relations department. Like his earlier brush with Vauclain, this meeting would bear fruit for Kuhler.

The acquaintance with Vauclain was renewed in 1928 after Kuhler, having resolved to become a force for changing the way America's railroads crafted their public image, moved to New York City. Kuhler was becoming well known for his etchings of industrial scenes and sought to include railroad images in his portfolio. From Vauclain came permission to sketch within Baldwin's Eddystone (Pa.) works. The result was a celebrated portfolio, *The Iron Horse in the Making*.

COMES THE REVOLUTION

Seeing the streamlining of established forms as a means of modernizing the public's perception of railroads in the face of increasing air and highway competition, Kuhler published conceptual drawings that gained wide-



Kuhler's streamlined-steam proposals ranged from an early study for an NYC Hudson (below left) to an Atlantic Coast Line 4-4-4-4. None of these was executed.

spread attention. Among the earliest was his 1928 proposal to streamline New York Central's recently delivered J-1 Hudsons. Industrial America was being awakened to the importance of packaging and marketing its output in order to spur consumer demand. The ensuing marriage of industry and design forever changed the way America and the world regarded consumer products, from toasters to trains.

With lightweight, internal-combustion passenger trains gaining favor in the early 1930's, some of Kuhler's conceptual efforts in that area were brought to the attention of Union Pacific's Gene Adams, then laying the groundwork for his road's pioneering foray into streamlining, the M-10000. Pullman-Standard, St. Louis Car, and Brill-ACF were developing proposals for UP's new train. With a referral from Adams, Kuhler was retained by Brill. Although his client lost the contract to P-S, Kuhler was, as he recalled in his memoirs, "now a participant in the railroad revolution."

While pragmatic about railroading's internal-combustion future, Kuhler still believed the pinnacle of steam technology lay ahead and warranted the same modern styling as its emerging challengers. Lima Locomotive Works, whose plant was in Lima, Ohio, had earned a reputation for innovation and superior craftsmanship, perhaps explaining why Kuhler approached W. H. Winterrowd in Lima's New York office with proposals to modernize the look of the steam locomotive.

For reasons now unknown, Winterrowd surprised Kuhler by referring the designer instead to J. B. Ennis, vice-president, engineering, of Lima competitor American Locomotive Co. From that meeting sprang a long creative association between Kuhler and Alco, first in the creation of advertising and conceptual art, and later as a design consultant specializing in streamlining the locomotive form.

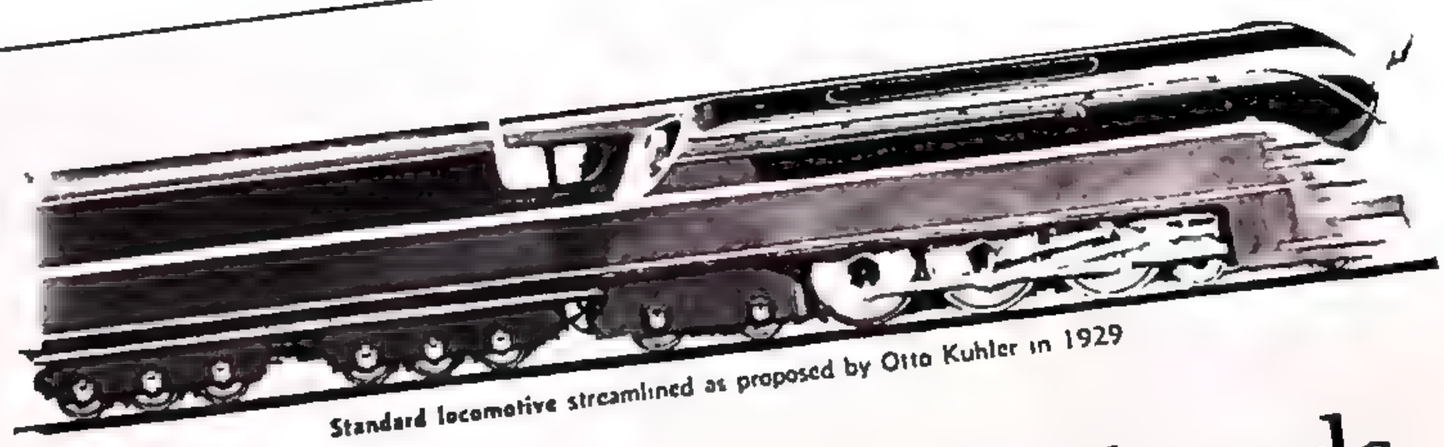
Streamlining of railroad equipment was for all practical purposes a public-relations endeavor intended to forestall declining ridership. Designers needed not lose sleep over wind resistance, and attempts to reduce it, to the degree that the subject preoccupied their aeronautical counterparts. As a means of reducing fuel consumption, lightweight construction was of much greater value than streamlined styling.

Kuhler underscored this in a November 15, 1935, presentation to the New York Railroad Club, stating, "Every competitor in passenger transportation, and many of those transporting goods alone, have taken advantage of sales appeal as expressed by streamlining." Going on to summarize recent developments among airlines and bus operators, Kuhler noted, "Streamstyling, on railroads, therefore, comes to a large extent in the field of the sales department, the passenger traffic manager and, with limitations, the freight traffic manager.

"The man in the street," Kuhler continued, "does not know anything about high-pressure boilers, feedwater heaters, roller bearings, etc., and above all, he does not care. He only sees the locomotive as a steam locomotive and, if locomotive Model 1936 looks like Model 1916, he refuses to be impressed. Even the best and biggest advertising will fail to convince him."

Having been spurned more than once by conservative elements within railroad and supplier management, Kuhler became adept at using the print media to deliver his message of railroad futurism

FROM PRODUCT ENGINEERING, JUNE 1934; K. J. HOLLAND COLL.



Standard locomotive streamlined as proposed by Otto Kuhler in 1929

Streamlining the Railroads

A brief historical survey of streamlining and the fundamental changes that it is now making in the engineering principles being applied in the design of vehicles

O. KUHLER
Industrial Designer

THE vogue of streamlining we are experiencing today has its roots in the past. Even when ... science was practically unknown, ... all kinds of trans- ... output and varying adhesive friction constantly alter the requirements. While in a free-moving, free-flying body we may go the limit for aerodynamic efficiency, the above-mentioned variable factors in ground vehicles demand a more conservative development, largely gov- ... demands of serviceability.

directly to the broader industry and public. Readers of publications as diverse as *Railway Age*, the *New York Times*, and *Railroad Magazine* were exposed to his streamlined evangelism.

Kuhler knew only too well that his rationale for streamlining also applied to diesels and electrics. "Just as with the streamlined steam locomotive," he said, "variety on the front end of Diesel-electric trains is possible. Shape and color may be used for identification." Indeed, the first Kuhler streamlining effort to see production had been a rather restrained mid-1930's "cleanlining" of Alco's "high-hood" diesel switcher carbody, followed by a thorough and sleek exterior streamlining of Gulf, Mobile & Northern's *Rebel*, a pair of lightweight trains built by American Car & Foundry and powered by Alco in 1935.

C. V. SIMON PHOTO, J. DAVID INGLES COLLECTION

The first Kuhler designs to be built were diesels: Alco HH switchers and GM&N's *Rebel* motor trains, one of which is at Murphysboro, Ill., after the GM&O merger.

THE HIAWATHAS

Alternately praised by traffic departments and cursed by operating staff, full shrouding of steam locomotives offered a sculptured canvas for increasingly colorful liveries, but added weight and hindered access to running gear and components. The same zeal to conceal was evident in early streamlined passenger-car design, with underbody equipment and even trucks hidden behind hinged skirts.

Otto Kuhler was particularly blunt in his 1935 appraisal of emerging trends in steam-locomotive streamlining. In his New York Railroad Club address, he observed, "Streamline freak locomotives have been built lately the world over. Most of them are badly conceived in their outline and their shrouding and covering; in most of them the inherent beauty and the 'personality' of the steam locomotive is lost."

Although Kuhler was involved in the streamlining of Milwaukee Road's Alco-built class A Atlantics of 1935—America's first steam locomotives to be streamlined at their construction—and was responsible for their striking paint scheme, the builder and railroad prevailed in the shroud design. The torpedo styling favored by Kuhler in conceptual renderings and most of his subsequent commissions would have to wait; the *Hiawatha* Atlantics emerged, to great fanfare, in shovel-nosed shrouds.

FROM METAL PROGRESS, AUGUST 1934; K. J. HOLLAND COLL.

Streamlined Steam Locomotive Suggested by American Locomotive Co.

WHAT PRICE BEAUTY

of line and color

...r O. Kuhler

Industrial Designer

New York

MANY manufacturers have discovered that their product is more salable if technical ...rfection is expressed by a well-designed out... appearance. Package design may ... ...able step in this ... design may ... fully done before new dies, patterns and ... tools are made. Logically ... turn to ...

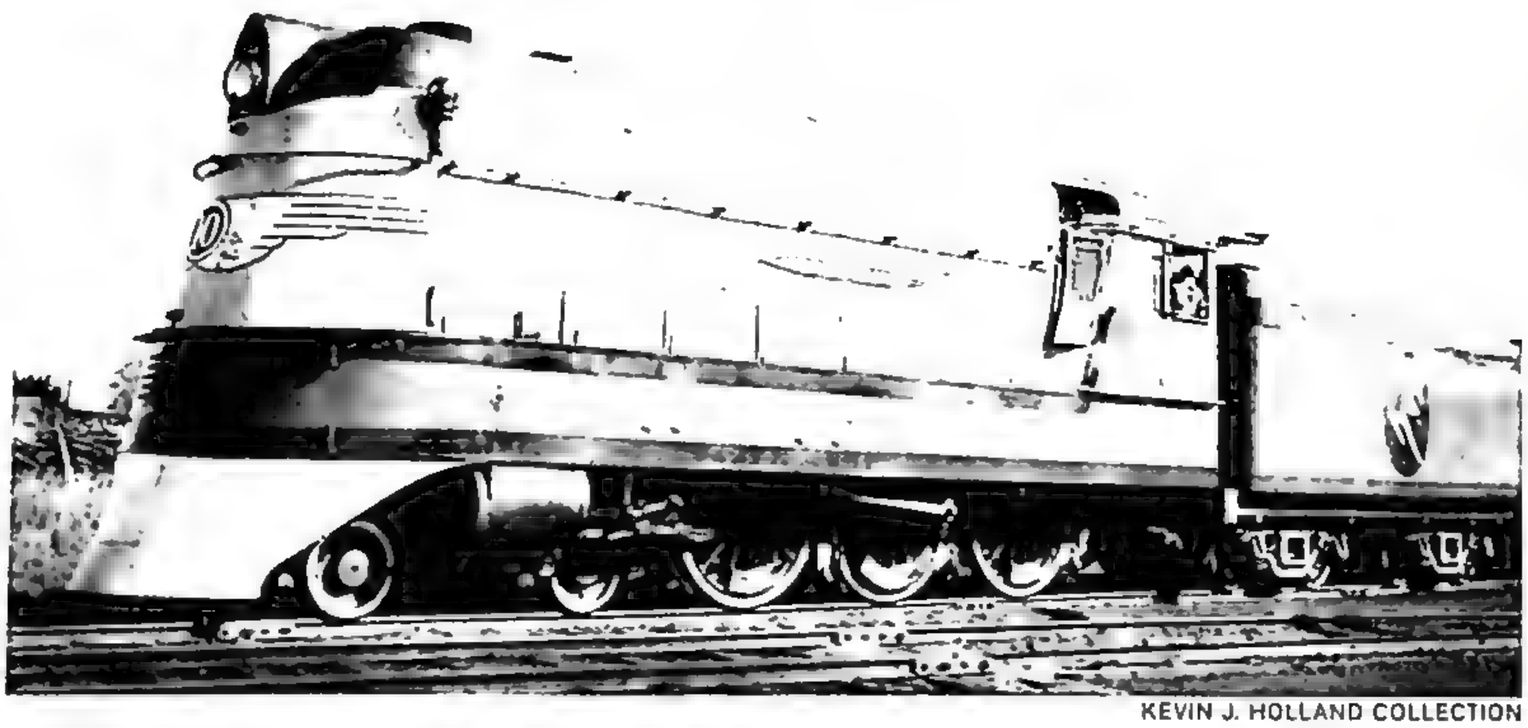
Given his ties to Alco at the time, Kuhler worded his criticism of full shrouding carefully, and with a qualifier: ". . . the ultimate aerodynamic streamline form is not justified under today's and tomorrow's operating conditions in this country. . . . In no case, if correctly conceived and correctly streamlined, does the shrouding have to be ugly. That it can be made beautiful has never been shown more spectacularly than in the performance of the new streamstyled colorful train *Hiawatha* . . ."

Kuhler then confirmed where his own styling preferences lay. "It is entirely wrong to assume that all future engines have to look like the streamline locomotive on the *Hiawatha*." Some did, including some styled by Kuhler himself. However, virtually all of his ensuing streamlined steam creations were notable for the manner in which, in Kuhler's words, "the characteristic features of the steam locomotive have been retained in the streamlining."

So resounding was the public's embrace of the *Hiawathas* that the Milwaukee Road completely re-equipped its expanding fleet in late 1938. Reprising their collaboration on the original *Hi*, Kuhler and the Milwaukee's Karl F. Nystrom created new, third-generation cars, identifiable from their predecessors by their horizontal side ribs and revised livery.

Delivered at the same time, but not intended solely for the Chicago-Twin Cities *Hiawathas*, were the six class F7 streamlined 4-6-4's (Nos. 100-105). Built by Alco, they were "Speedlined

RICHARD H. KINDIG PHOTO, COURTESY FOUR WAYS WEST PUBLICATIONS



KEVIN J. HOLLAND COLLECTION

For Milwaukee Road's *Hiawathas*, Kuhler styled brand-new Alco Atlantics (above, at Milwaukee in 1939) and Hudsons (right, entering Chicago in '41). For connecting *Hiawatha* services, the road itself streamlined older Ten-Wheelers (left) and Pacifics (far right) in the style of the new power.

by Otto Kuhler"—and sported plaques on their cylinder skirts that said so. Elements of the new Hudsons' shrouding design—particularly the way in which the skyline casing flowed down over the top of the nose and into the headlight bezel—were straight out of conceptual sketches prepared by Kuhler in 1933 and published in *Portraits of the Iron Horse* (Rand McNally, 1937). Kuhler had already applied this particular styling trait to the GM&N's *Rebel*.

Although on record as preferring streamlining that maintained a steam locomotive's "basic form," Kuhler deferred to his clients and retained the general lines of the class A shrouds, with abbreviated skirts and a modified skyline casing the major differences on the F7's. He accentuated the Hudsons' greater length by boldly striping the cylinder skirts and running boards, stretching the stainless-steel nose wings, and painting the skyline casing black. The vestibule-type cab brought to mind a greenhouse, with its expanse of wraparound glazing.

So powerful was its *Hiawatha* "brand" that the Milwaukee shrouded a pair of turn-of-the-century 4-6-0's in 1936-37 to emulate the class A 4-4-2's in "North Woods" connecting service. Four 1910-vintage Pacifics, restyled to mimic the F7 Hudsons, followed in '41.

Hiawatha motive power garnered much attention, but the trains' opposite end was just as interesting. Kuhler added an assembly of intersecting fins to the observation car of the 1939 *Hiawatha*, but Nystrom's "beaver tail" profile—inspired by the contemporary Chrysler Airflow—was largely unchanged from its 1935 introduction.

BULLET NOSE FOR THE B&O

In 1937, Kuhler was able to take his crusade for bullet-nosed streamlined steam beyond the drawing board with a boldly won commission to create an all-new *Royal Blue* for Baltimore & Ohio. Critical of the 1935 edition of the train and on the strength of his recent *Hiawatha* work, Kuhler came away from a meeting with B&O President Daniel Willard with a new title and a new challenge. (Thanks to Robert Van Sant, Kuhler had actually been on the B&O payroll, as art director of the company magazine, while the 1935 train was under development, but had steered clear of the project for political reasons.)

Retained by Willard as B&O's Consulting Engineer of Design, Kuhler was given responsibility for the interior layout and decoration of a new

RICHARD H. KINDIG

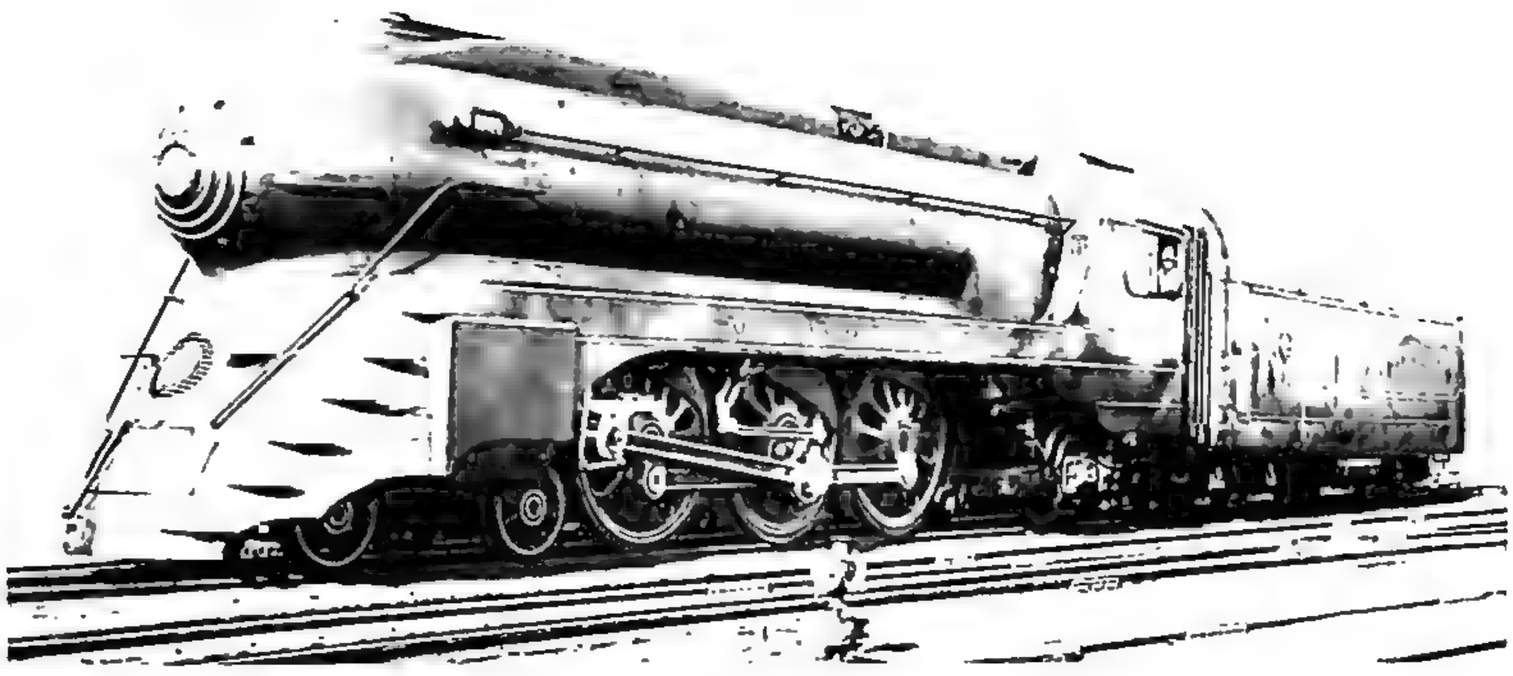
J. DAVID INGLES COLLECTION

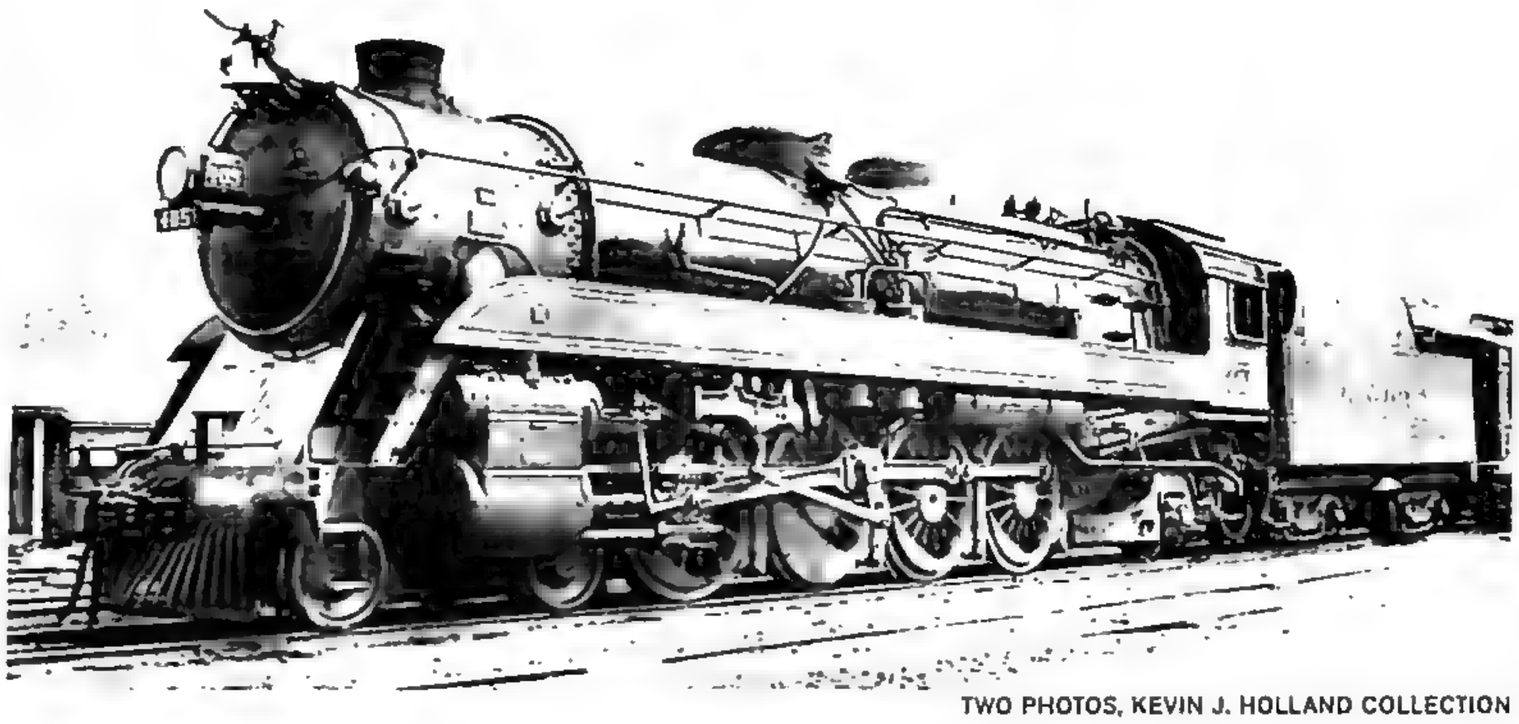
eight-car *Royal Blue*, and followed this with similarly modernized consists for the *Capitol Limited* and *National Limited*. In each case, groups of heavyweight cars were rebuilt, retaining their basic architecture but with arched roofs, full-width diaphragms, folding steps, and deep underbody skirts for a cost-effective streamstyled look. Kuhler's modernized *Royal Blue* replaced a lightweight 1935 ACF-built trainset, which was reassigned from its Jersey City-Washington route to the Alton Railroad (then a B&O subsidiary) between Chicago and St. Louis. Concerns over the ACF cars' riding qualities had influenced Kuhler's proposal to rebuild heavyweight cars.

Kuhler's *Royal Blue* commission included the locomotive. Ten-year-old P-7 Pacific 5304 became the first recipient of what became Kuhler's trademark bullet nose. Although "sharper," 5304's shrouding generally resembled that applied by Raymond Loewy to Pennsylvania Railroad K4s Pacific 3768 the year before, with the locomotive's major elements—boiler, smokebox, pilot, and cab—smoothed yet readily discernable. Such retention of the locomotive's basic form had been one of Kuhler's most frequently repeated conceptual themes, and would be the basis of most of his steam styling efforts.

B&O 5304's transformation went beyond cosmetics and was thorough enough to warrant its very own P-7a classification. The 4-6-2 debuted on the new *Royal Blue* in December 1937, three months after Kuhler's modernized cars entered service. Although the locomotive lost its streamlining in 1939, its days in the limelight were not over. After the war, it became one of two U.S. steam locomotives to be *re*-streamlined. Restyled, 5304 ran for a decade on the *Cincinnatian*.

Drawing inspiration from the B&O's Civil War role, Kuhler gave the exterior of his modernized trains a stately livery of blue and gray, trimmed in black with gold lettering and striping. B&O's Capitol Dome herald—in a simplified design also crafted by Kuhler—graced each car. Although his work with B&O ended on the eve of World War II (rendering a never-built, experimental 16-cylinder steam locomotive), Kuhler's blue and gray remained B&O's passenger colors for more than





TWO PHOTOS, KEVIN J. HOLLAND COLLECTION

B&O 5304 (top) had the bullet nose Kuhler favored for streamlined steam designs. NYO&W 405's bare-bones makeover reflected the tight budget of its owner.

three decades, and his Capitol Dome herald lasted even longer.

A footnote to Kuhler's B&O work was the fleet of buses styled to modernize the road's Manhattan-Jersey City connecting service. Painted to match the *Royal Blue*, and with a simplified Capitol Dome herald for a radiator grille, the ice-cooled White Motor Co. coaches were colorful promoters for the B&O on the streets of New York.

OTHER WORK, AND THE GEMS

Otto Kuhler's friendship with New York, Ontario & Western trustee Fred Lyford led, in 1937, to the shoestring restyling of 4-8-2 No. 405 and a group of heavyweight cars operating as the *Mountaineer*, aboard which residents of New York City and suburban New Jersey could escape to the nearby Catskill Mountains. For just $8500, Kuhler gave the O&W's *Mountaineer* a maroon-and-orange makeover replete with Art Deco accents, but left the cars unstreamlined and un-air-conditioned. The exterior treatment—with skirted running boards on the locomotive and pinstripes trailing from tender to cars—foreshadowed the designer's work on the Lehigh Valley's *Asa Packer* two years later.

Chicago & North Western 4-6-4's Nos. 4001-4009, class E-4, were built by Alco and delivered during March and April 1938. There was more than a hint of *Hiawatha* in their shovel-nosed streamlining, influenced by the Milwaukee F7 Hudsons then under development at the same builder.

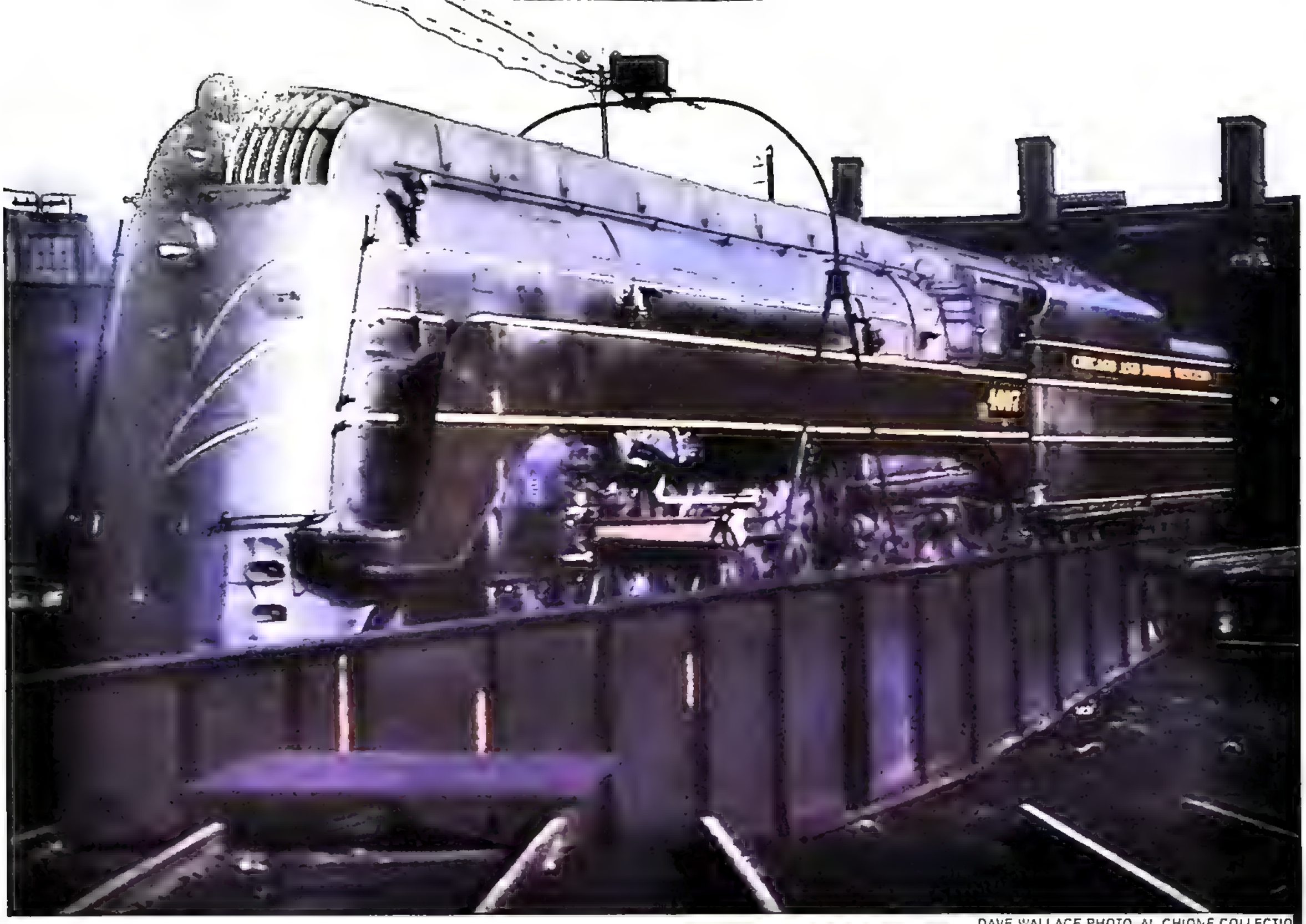
Kuhler was an acquaintance of Lehigh Valley President Duncan Kerr, and in 1938 the designer was commissioned to revamp a gas-electric car in the hope of building traffic between Newark, N.J., and Mauch Chunk, Pa. The gas-electric was a prelude to the *Asa Packer*, a four-car day train of modernized heavyweights led by a "cleanlined"—but not streamlined—Pacific. Named to honor the road's first president, the *Asa Packer* entered revenue service on February 1, 1939. A striking yellow-and-black livery did much to update the appearance of the essentially unmodernized cars and locomotive. Pacific 2023 was given only modest running board skirts and a sheet-metal "chin" between pilot and smokebox. A matching Pacific, No. 2022, was outshopped in April 1939 to permit twice-daily service aimed at New York World's Fair visitors. Having boosted the public profile of the LV's passenger trains, the *Asa Packer* was merely a taste of things to come. Kerr and Kuhler had turned their attention to a more extensive streamlining of the Valley's steam-powered passenger trains.

The *John Wilkes* was christened on June 2, 1939. The name, selected by Kerr, honored an 18th century British parliamentarian, author, and champion of Colonial American rights. The train's streamlined Pacifics and all but one of its nine modernized—but unstreamlined—heavyweight cars were the product of LV's Sayre (Pa.) shops, under the guidance of Superintendent of Motive Power John Laux.

While the heavyweight cars harked to the *Asa Packer*, the *John Wilkes*' locomotives were classic Kuhler. K-5 class Pacifics Nos. 2101 and 2102 were Baldwin products dating from 1916, but Kuhler drew from his growing repertoire to make them the equal of any streamlined locomotives in service then or after. A bullet nose, with centered headlight, brought to mind his work on B&O's *Royal Blue*. The assembly of horizontal and vertical "speedline" fins between the LV engines' pilot and smokebox were pure 1939 *Hiawatha* beaver-tail. A low skyline casing and abundant stainless-steel pinstriping gave the Pacifics a windswept look. The headlight bezel was in the form of a stainless-steel diamond, evoking the railroad's herald and hinting at a decor element repeated in the car interiors. The cab windows, curved at their forward end and divided into three horizontal panels, became an integral part of the striping that extended across the upper tender and onto the consist. President Kerr had selected black and red as the new train's signature, honoring on-line Cornell University's school colors.

As the *John Wilkes* was taking shape, plans were under way to effect a similar streamlining of the Valley's New York-Buffalo flagship *Black Diamond*. Pacifics 2089, 2093 [page 82], and 2097 were selected for streamlining and assignment to the train at its April 1940 relaunching. The 2089 had been homebuilt at Sayre in 1925; the others were delivered by Alco in 1924. The trio emerged as near copies of the *John Wilkes*' Pacifics, with refinements in shrouding and handrail treatment.

Wartime austerity saw the five streamlined LV Pacifics lose their bright trim and intricate paint, re-



DAVE WALLACE PHOTO, AL CHIONE COLLECTIO

CURT TILLOTSON COLLECTION

C&NW's green Hudsons like 4007 (above, at 40th Street, Chicago, in March 1947) resembled MILW's *Hiawatha* 4-6-4's, while Southern 1380 (at Reidsville, N.C., in March '52) had the classic Kuhler look.

placed by solid black with a wide red stripe. By June 1948, Alco PA diesels had bumped steam from LV's intercity schedules. The displaced Pacifics returned to Sayre to have Kuhler's marvelous streamlining removed. By the end of 1951 the last of the once-streamlined speedsters had been scrapped.

GREEN GLORY

Otto Kuhler's final steam "speedlining" effort was his personal favorite, yet one for which he received no payment. Southern Railway inaugurated its New York-Memphis *Tennessean* on the eve of World War II. Class Ps-4 Pacific 1380, built by Alco in 1923, was in Southern's Spencer (N.C.) shops at the time the *Tennessean*'s motive-power needs were being defined, and the 4-6-2 was selected to be streamlined to lead the new train between Monroe, Va. (near Lynchburg), and Washington. (Norfolk & Western handled the train between Monroe and Bristol, Va., and Southern diesels west of there.) Southern's big Ps-4 Pacifics were already renowned for their elegant green paint, and Kuhler retained this hallmark in his restyling of 1380.

The designer revisited his 1937 *Royal Blue* for inspiration—1380's nose emulated the B&O Pacific's torpedo fairing right down to the concentric headlight trim. The full-length skyline casing ended in a smoothly beveled air intake trimmed with stainless steel. A few feet aft, the casing widened to incorporate marker-light and numberboard housings.

This combination of styling features was a dead ringer for one of Kuhler's 1933 conceptual drawings (published in *Portraits of the Iron Horse*). The gap between the smooth

J. DAVID INGLES COLLECTION

Kuhler's final full-train styling project was GM&O's *Gulf Coast Rebel*, pulled, appropriately enough, by one of his Alco DL109 diesels; finned-nose No. 252 is at Mobile.

pilot and nose cone was bridged by a thick fin, another Kuhler trademark. Narrow running-board skirts curved down around the cylinders and were trimmed in a sweeping crescent—a subtle bid on Kuhler's part, perhaps, for consideration when the time came to streamline Southern's flagship *Crescent Limited*. (Southern's fleet leader was not fully re-equipped until 1950, by which time it was hauled by EMD diesels.) Southern Railway medallions on each of 1380's cylinder covers, polished cylinder-head covers, and gold-tone trim enhanced the 4-6-2's package. The tender sides were bisected by a curving separation between the engine's green paint and an aluminum-painted aft portion designed to blend with the stainless-steel cars.

The result was stunning, particularly so for Kuhler when he spied the streamlined Ps-4 for the first time, outside Washington Union Station in 1941. His last contact with the Southern had been in late December 1940, when he delivered his rendering for the project to the road's Washington headquarters. In the rush to meet a Christmas deadline, he neglected to make copies for his lawyer. The railway, it seems, felt free to use Kuhler's design without the obligation of payment. In his memoirs, Kuhler expressed gratitude that the Southern had at least copied his design in its entirety, without "bitched up . . . improvement of their own."

Southern dieselized its Washington Division after the war and demoted the 1380 to general duties, but with its shrouding intact. Kuhler's last streamlined steam locomotive was officially retired July 29, 1953, and scrapped.

NEW HORIZONS

Although eschewing commissions to "streamline" household items—the results of which he termed "effeminate gadgetry"—Kuhler did venture into architectural work. In conjunction with client Johns-Manville, he executed prewar interior modernizations of nine passenger stations, most notably the Milwaukee Road's in its namesake city.

When Alco entered the passenger diesel market in 1939, the builder turned to its longtime design consultant to create the twin-engined, 2000 h.p. units' carbody styling. Kuhler delivered a distinctive pinched-nose design with a three-panel windshield. Early renderings showed a grilled center "brow," pierced by the headlight and curving down over the center windshield panel onto the nose.

Eventually sold to eight railroads, production units retained the brow, sans grille. Headlights were relocated to the nose, and until early 1941 were housed within a finned bezel. Alco's packaging of the series, which encompassed designations DL103 through DL109, was vintage Kuhler: the brow was a device dating to his early 1930's conceptual work and employed on the GM&N *Rebel* power cars, the *Hiawatha* F7 Hudsons, and ACF railcars, while fins of varying size adorned his 1938 Milwaukee beaver-tail restyling, LV's *John Wilkes*' Pacifics, and Southern 1380. When Alco fielded its set of "Black Maria" freight prototype units in 1945 (the predecessor of the FA's), they emerged in shortened versions of Kuhler's DL109 carbody.

DL109 power led Kuhler's final stem-to-stern passenger-train styling effort, Gulf, Mobile & Ohio's modernized heavyweight *Gulf Coast Rebel* of 1940 for St. Louis-Mobile, Ala., service.

Kuhler augmented his portfolio with transit commissions in the immediate pre- and postwar period, including subway car designs for Philadelphia, New York, and Boston, and a streetcar design for Brill-ACF.

The 1939-40 New York World's Fair had heralded a shift from the heights of Art Deco to a more austere modernism. Although industrial designers led the way, Kuhler's entrenched, idiosyncratic style was at odds with the shift. Even at his peak as a designer in the late 1930's, Kuhler saw his best work eclipsed by competitors. His design career never recovered from the interruption of war, and steam was dying. Longtime client Alco struck a sales and marketing affiliation with General Electric in 1940, and when diesel production began in earnest after the war, GE's Ray Patten had assumed the builder's locomotive-design reins, evidenced in the PA and FA styling.

Among projects of Kuhler's that never went beyond the proposal stage were steam streamlinings for Atlantic Coast Line, New Haven, C&NW, and Rock Island. A measure of his success, though, lay in the six distinct groups of steam locomotives he had brought to streamlined fruition—more than could be claimed by rivals Raymond Loewy or Henry Dreyfuss.

Following three years in the direct employ of St. Louis Car Co., with corporate politics a chronic irritant, Kuhler's life and career took a sharp turn. His quest to awaken America's railroads to streamlining at an end, Kuhler chose to depart the industry. In 1948, he and his wife, Simonne, moved west—first to Colorado, later to Santa Fe, N.Mex. In retirement, and until his death in 1977, the artist renewed his passion for painting, abandoning three dimensions for two. Steam-locomotive images frequented his easel, but few, ironically, were streamlined. ■

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A4CE

Streamliner

SNAPSHOTS 26

Interurban innovations

ELECTROLINERS: Acclaimed as the most successful U.S. interurban equipment ever built, Chicago North Shore & Milwaukee's two *Electroliners* of 1940 were at home on Windy City 'L' tracks and 90-mph tangents. Here, No. 801 bridges Oklahoma Avenue on its way out of Milwaukee in 1948.

TWO PHOTOS GEORGE KRAMBLES; KRAMBLES-PETERSON ARCHIVE

BRILL BULLETS: Years before the steam roads hit on streamlining, wind-tunnel tests and the J. G. Brill Co. produced a high-speed interurban design. Philadelphia & Western got 10 "Bullets" in 1931; Fonda, Johnstown & Gloversville, 5 in '32. The FJ&G cars moved to Utah's Bamberger Railroad, on which two are seen in '48 at Ogden.

Southern's tortuous

How energetic Ernest E. Norris modernized his conservative railroad's passenger service

decision to streamline

BY BILL SCHAFER

IN THE 1930's, the culture of Southern Railway management was a product of the Old South. Although the company was hemorrhaging cash, its president, the patrician Fairfax Harrison (who traced his lineage to the very First Families of Virginia, in the 17th century), apparently believed the best way to endure the Depression was to lie low. It was on Harrison's watch, for example, that Southern froze its locomotive technology in 1928—Southern never owned a steam engine with a four-wheel trailing truck. It was also on Harrison's watch that Southern eschewed air-conditioned coaches. And it was on Harrison's watch, moreover, that Southern sat out what he thought was a fad—the streamline and diesel craze that fascinated the public and the industry.

SOJTHERN RWY.; SRHA COLLECTION

FAIRFAX HARRISON

COURTESY NORFOLK SOUTHERN

ERNEST E. NORRIS

Harrison retired in 1937 and was succeeded by the remarkable Ernest E. Norris (1882-1958), a dynamo of a man whose career with Southern spanned almost exactly 50 years. Norris was smart, energetic, inquisitive . . . and a Midwesterner. But no greater salesman of the Southern Railway and the region it served ever breathed.

Born in Hoopeston, Ill., hard by the Indiana border, Norris was fascinated by the telegraph. Young Ernest pestered the local Western Union operator to teach him Morse in hopes that the skill would land him a job with a railroad. When he was 17, Norris read where a Chicago & North Western operator in Arlington Heights, Ill., had committed suicide. With nothing to lose, Norris wrote the agent there, described his skill with the key, and asked for the dead man's job. To everyone's surprise (especially his), got it.

Norris attracted attention. In less than a year, he was promoted to agent at Reedsville, Wis., near Manitowoc, and by age 20, he was a dispatcher in the C&NW offices in Chicago.

In 1902, a friend persuaded Norris to join the Southern Railway in Washington, D.C., as a car-service agent, and from there his career took off. Within five years, he was superintendent of the Atlanta Division, an important post, where he served for the next 10 years. In 1918, Norris became assistant to the president (Harrison), won the "old man's" trust, and was shortly thereafter sent to St. Louis as vice president of the Mobile & Ohio, a Southern-owned property at the time.

The M&O was a not a rich railroad, operating through the agricultural Deep South between St. Louis and Mobile, Ala. It enjoyed a certain level of autonomy, however, and Norris did his best to nurse it through the 1920's. One challenge he confronted was the losses incurred by local passenger trains. Few people rode them, but they handled the mail, and no credible case could be made for their discontinuance. In response, the M&O acquired gas-electric doodlebugs to displace steam locomotives, which drastically reduced operating costs.

In 1932, M&O slipped into receivership and Norris was appointed receiver. Shortly thereafter, Gulf, Mobile & Northern began negotiations to take the M&O off Southern's hands, which occurred in 1940. In 1933 Norris returned to Washington as Southern's vice president for operations, where the big railroad was in trouble. A heavy debt load, a horrible per-diem imbalance, and depressed traffic levels threatened insolvency. Norris knew he had to cut costs quickly.

A-C IS NOT ENOUGH

Among Norris' initiatives was a 1935 study concluding that "two-unit diesel motor-propelled trains in local service" would save a total of $200,000 a year if used to replace steam on 10 secondary schedules. Despite the find-

A publicity photo of the *Southerner* near Manassas, Va., symbolizes the difficulty the railway had in leaping into modernity.

WALTER L. NEWTON PHOTO; LOUIS M. NEWTON COLLECTION

Memphis Division train 7, the *Jo[illegible]seler*, with one of Southern's six FM/St. Louis Car trains, gets orders from operator W. L. Fold at Wauhatchie, Tenn., in spring 1940, before entering NC&StL trackage rights.

JAMES G. LaVAKE

ings, Fairfax Harrison refused to believe the new trains could produce labor savings and dismissed the need for the newfangled equipment.

Instead, Southern reacted to the trends of the 1930's passenger market by dropping coach fares to a streamliner-level 1 cent per mile but without modern cars or, at least, air-conditioned coaches. Those who have "enjoyed" summer steam excursions in open-window coaches will understand why everyday travel on the Southern was not particularly popular.

It was different in the sleepers, where the Pullman Company by 1935 had air-conditioned most of the cars regularly assigned to the Southern. Apparently, Harrison thought his railway had fulfilled its obligation to travelers when it air-conditioned the dining cars, which were used largely by Pullman patrons.

After Harrison's retirement, Norris immediately ordered a $1 million program to air-condition 108 coaches and dining cars. By mid-1938, most of Southern's through coaches were air-conditioned, but this wasn't enough to fill up the trains, and high costs remained a problem.

Reducing those costs would take money that Southern didn't have, so despite its conservative leanings, the railway held its nose and borrowed from the Reconstruction Finance Corporation, one of President Franklin Roosevelt's New Deal creations. This gave the road enough money to purchase nearly 6000 freight cars (to erase the per-diem imbalance and handle growing traffic) and six Fairbanks-Morse-powered railcars and coach trailers from St. Louis Car Co. The railcars, although sporting a rounded nose and a colorful green-and-silver paint scheme, were of rivet-

JAMES G. LaVAKE

Two E6A's (middle photo) keep company in the Atlanta roundhouse in October 1947 with FM power car 3, one of two used on the *Cracker* to Brunswick, Ga. At Memphis (Tenn.) Union Station in August 1952 (left), the *Tennessean* is in the charge of half of Southern's Otto Kuhler-styled DL passenger cabs (three each DL109 cabs, DL110 boosters); F3 6107 is backing in with train 35, the daytime local from Chattanooga.

SOUTHERN RAILWAY HISTORICAL ASSOCIATION COLLECTION

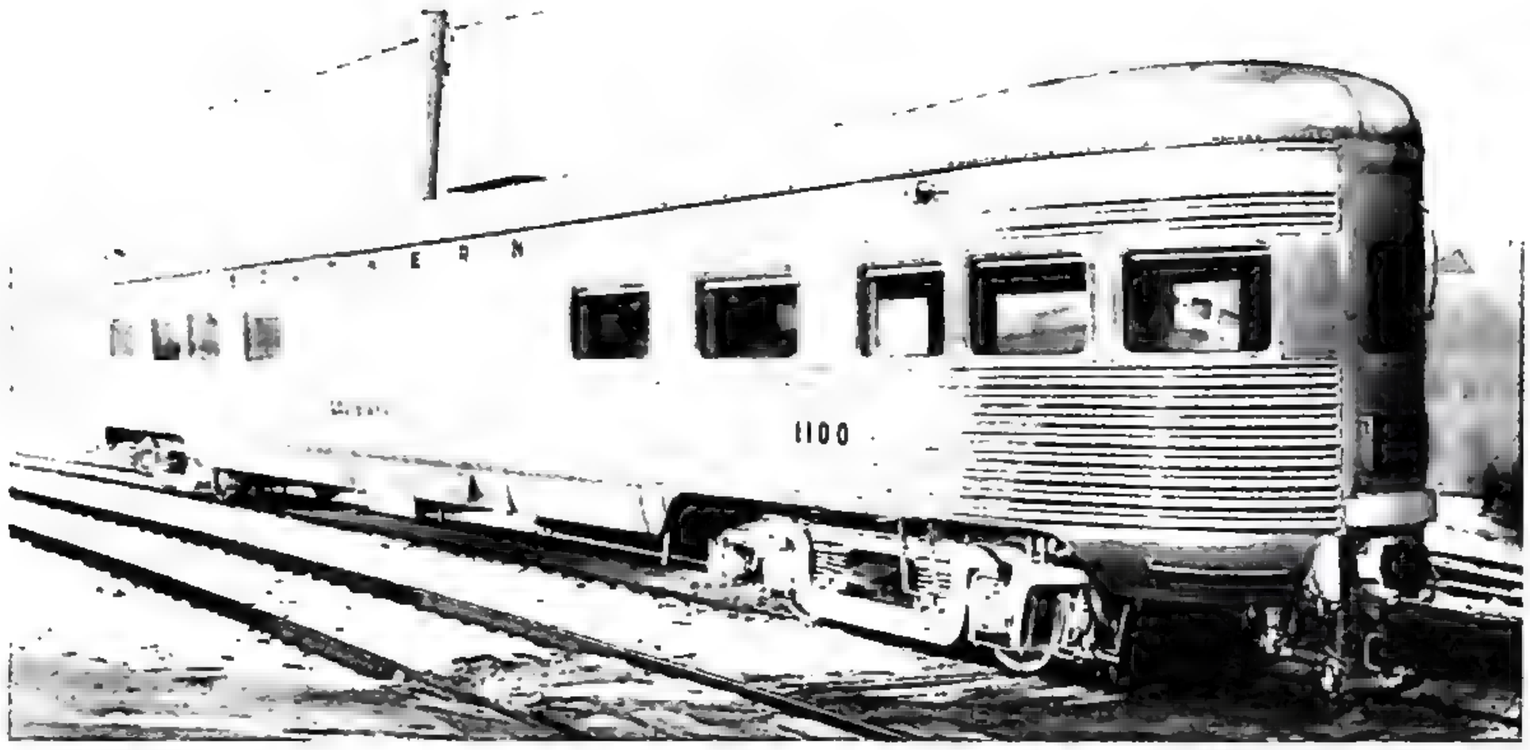
The northbound *Southerner* makes its station stop at Anniston, Ala. (above), its E6 halting on the diamond of the Rome (Ga.)-Selma-Demopolis (Ala.) branch. At Rader, Tenn. (west of Greeneville), in early 1947 (right), the 8:30 a.m. passage of the northbound *Tennessean* was regularly greeted by the Myers' family dog, Rex II, seen racing to meet the train. He will vault the fence on the stile and fetch a newspaper or two thrown down by the engine crew.

SOUTHERN RAILWAY PHOTO; SRHA COLLECTION

ed steel construction and definitely not streamliners. Their mission was to reduce costs, not win beauty contests, and they entered service on a variety of local schedules—mainline and branchline—in 1939. The Verdict? Mission accomplished.

With an improving economy, more hard-surface roads, and the unremitting popularity of the automobile, the Southern had to do something about its lack of popularity with the traveling public. From 1938 to 1940, its freight revenues rose 22 percent, but passenger income grew at only half that rate. This was not the experience at most other railroads, where passenger- and freight-revenue growth were about even. Bus and auto competition could not be blamed for slow, smoky trains; Southern needed to modernize.

But how? Headquartered in Washington, Southern's management kept up with industry developments, and the streamliner salesmen were no strangers to Southern's stately office building at 15th and K streets. Like most railroads, Southern served a variety of markets and populations. Well-maintained heavyweight Pullmans accommodated the business, professional, and expense-account crowd, but overall, the South was poor. Would new equipment attract enough coach passengers to make a streamliner worthwhile?



CLASSIC TRAINS COLLECTION

SOUTHERN RAILWAY PHOTO; CLASSIC TRAINS COLLECTION

In an oddity, the 18 Southern-owned cars (PRR owned 3 coaches) of the 1941 Pullman-Standard *Southerner* shared 12 state names (plus D.C.). Tavern lounge observation cars 1100-1102 were all *Louisiana*.

COACH OR PULLMAN?

In early 1939, Seaboard Air Line Railway, in receivership but a competitive thorn in Southern's side, inaugurated its diesel-powered, seven-car, Budd-built *Silver Meteor* coach streamliner between New York and Florida. A day before its maiden trip, Harry DeButts, Norris's successor as Southern's operating vice president, rode a demonstration run between Philadelphia and New York and came away impressed. The *Meteor* closely followed the design of Santa Fe's Chicago-Los Angeles *El Capitan*, in service since February 1938.

Santa Fe in those days had become a streamliner laboratory for two different schools of thought. The Budd-built *El Cap* provided fast, luxurious coach service, and succeeded superbly in attracting travelers on a budget. The train continued to sell out even after repeated additions to its consists. Then there was the *Super Chief*, all-Pullman and extra fare—it had become the quintessence of streamlined luxury, and it, too, ran full. Which breed of streamliner was better? Both made money, but the *Super Chief* yielded a higher rate of return, while *El Capitan* generated more cash.

The simple fact was that few railroads served a territory that could attract the upper-crust clientele to support a *Super Chief*. But most roads could see themselves running an all-coach train in the *El Capitan* mold. Southern waffled. It liked the idea of an all-coach train but didn't want to ignore the first-class faction, either.

Southern nearly took the plunge in August 1939. The Midwest-Florida winter-only heavyweight coach-and-sleeper *Florida Sunbeam* had run with heavy loads during the 1938-39 season, and Southern and the train's other partners, New York Central and Seaboard, expected to add more Pullmans for 1939-40. R. K. McClain, Southern's assistant vice president for operations, figured that the extra equipment would require the *Sunbeam* to run regularly in two sections unless the Southern ran it as an all-Pullman train and provided the coach customers with their own streamliner.

This was an opening for which Budd and Pullman-Standard had been waiting, and they wasted no time importuning Norris and DeButts to buy something new. Budd reminded them of the mounting and continuing success of the *El Capitan*, adding that the *Sunbeam*'s other partners probably would welcome the idea of a streamliner in light of Seaboard's stunning achievements with the *Meteor* and NYC's favorable experience with streamliners like the *Mercury* and the *20th Century Limited*. Each builder suggested that a single trainset, turning on a tight 30-hour Chicago-Miami schedule, could make two round trips a week and furnish the coach capacity foregone by an all-sleeper *Sunbeam*.

Pullman-Standard even committed to provide a complete seven-car consist by January 1, 1940, if Southern would place an order by the end of August 1939. The railway pleaded poverty. P-S countered with a no-lose lease/purchase deal: Southern could pay about $6000 per month rental for the train, and after eight years would own it. Or, if the railroad was unhappy at the end of the 1939-40 winter travel season, P-S would take the train back, no questions asked. With terms like these, how could Southern lose?

By dithering. Southern was still hung up on the *Super Chief* vs. *El Capitan* debate. Before the August deadline, Norris told the builders that "passenger service throughout the System presents manifold problems" to deciding which type of streamlined service—coach or Pullman—was right for his road. He decided instead to conduct a "comprehensive study" to arrive at a "competent decision." Norris continued: "My own impression is that both classes of service have an appeal, and that there are logical and profitable places for both."

The moment passed. No train was ordered. The *Sunbeam* ran another season as a heavyweight. Ten more winters and a World War would pass before a streamliner, the *New Royal Palm*, would link the Midwest with Florida via the Southern's rails.

PRESSURE FROM ATLANTA

Norris may have put off the carbuilders, but the pressure to modernize, specifically from the city of Atlanta and rival carrier Seaboard, was relentless. In early 1940, the *Atlanta Journal*, the city's afternoon newspaper, changed hands. This seemingly irrelevant event resulted in the Southern's being convinced that it needed a streamliner or two. The *Journal*'s editors launched a crusade urging the railroads of Atlanta to serve the city with "streamline trains for their own good . . . and the good of the territory they traverse." For starters, the paper suggested a Chicago-Miami and New York-New Orleans streamliner—both stopping in Atlanta, of course.

The suggestion was not far-fetched. Atlanta was, after all, the railroad and business center of the South, home to the regional headquarters of dozens of Fortune 500 firms as well as government offices. The city was also a major convention destination. All these factors suggested a lot of travelers.

At the time, Atlanta boasted 110 passenger trains a day, but not a single streamliner ["Crossroads of the South," Summer 2002 CLASSIC TRAINS]. If Seaboard and Atlantic Coast Line could succeed with silver coach trains between New York and Florida, the *Journal* reasoned, surely someone could justify putting Atlanta on the itinerary of a modern train. Whatever genteel southern protocols were abrogated by the newspaper's drum-beating, Atlantians (as the *Journal* called them) learned how good other cities had it, how bad Atlanta's trains were in comparison, and how easy it would be to fix the situation. All it took was a public-spirited railroad with money.

The *Journal* fueled its histrionics with reports from the field. At the beginning of the campaign, reporter Harry Wilensky embarked on a 10-day train-riding odyssey that took him first to Florida, then to Chicago, on the best and worst that the railroads had to offer. Once in Chicago, he found streamliner heaven—the *20th Century*, *Broadway*, *Super Chief* and *El Capitan*, *Hiawathas*, *400's*, *Rockets*, *City* trains—headed in all directions . . . except south. In awe of the variety, Wilensky concluded, correctly, that "streamliner competition has forced some changes for the better. The railroads are waking up. They are luring back some of their lost trade. They are beginning to merchandise their product."

When Rock Island announced in late March 1940 that Memphis would be served by the new *Choctaw Rocket*, the *Journal* wailed, "Memphis Gets 'Em—Why Not Atlanta?" The paper pouted that Memphis, a lesser commercial center with only 80 or so passenger trains a day, was getting a streamliner first: "Rock Island Line to operate Rockets out of city which ranks below Atlanta." What a revoltin' development!

It may have been coincidence or it may have been because of the *Journal*, but in May 1940, the newspaper learned that a consortium of railroads (*not* including the Southern) was planning daily Chicago-Florida coach streamliner service for the 1940-41 winter season. Three trainsets would provide the same schedule between the same end-points for the same fare. Each of the three trains, however, would traverse vastly different routes. The *City of Miami* would go via Birmingham and Jacksonville, the *South Wind* via Louisville and Montgomery, and the *Dixie Flagler* via Nashville and Atlanta. This resulted in a streamliner serving each intermediate point every third day. No matter—the *Journal* wasted no time declaring victory. "The announcement [of the *Dixie Flagler*] climaxes a three month campaign conducted by the Atlanta Journal . . ."

It was the Seaboard that may have finally goaded Southern into making a decision. In receivership but modernizing rapidly, Seaboard was Southern's direct competitor between Atlanta and the Northeast. In mid-April, Seaboard announced the dieselization and speed-up of a number of conventional heavyweight trains in the heart of Southern territory: the New York-Atlanta-Birmingham *Cotton States Special* and the *Robert E. Lee*, carrying through sleepers and competing head-to-head with Southern trains 29/39 and 40, and 35/7 and 8/36—not exactly plush name trains, but serving an important business clientele.

Southern, meanwhile, provided only token through service parallel to the Seaboard (that is, Birmingham to the North via Atlanta) because of the faster New York-Birmingham timing of Southern's *Birmingham Special*, which connected the end-points via Chattanooga, Bristol, and Roanoke, Va., in concert with Norfolk & Western. Southern had no immediate plans to dieselize any of these trains. But if the workaday *Cotton States Special* was getting modern motive power, could streamlining be far behind?

CLASSIC TRAINS COLLECTION

Unlike the *Southerner*'s cars, the *Tennessean*'s 26 lightweight cars each had different names. The three tavern lounge observations, 1150-1152, were *Washington* (above), *Knoxville*, and *Memphis*.

JOE WELSH COLLECTION

PHOTO, ROBERT MILNER, BROCHURE, SRHA COLLECTION

NEW TRAIN ON A NEW ROUTE

By summer, Norris's "comprehensive study's" "competent decision" was that—*ta da!*—Southern needed streamliners. But questions remained. Should the new trains operate on routes highly competitive with other railroads, or in corridors dominated by the Southern? Should they replace existing trains, or offer new service? Should they run faster, or just match existing schedules? Should they offer coach, or sleeping-car, accommodations exclusively, or a combination of both? And should they be diesel-powered for the distance, or should steam participate on part of the run? Answer: Yes . . . to all of the above.

Southern publicly broke its silence on the streamliner question during the week of October 13, 1940, when it announced plans to put in service 44 streamlined cars from Pullman-Standard plus three 2000 h.p. (E6A's) and two 4000 h.p. (E6 A-B combinations) diesel locomotives from General Motors. The names of the new trains—the *Southerner* and the *Tennessean*—were announced a few weeks later. Service was to start when the equipment was delivered in the first half of 1941.

The train chosen to open a new route, on a fast schedule, with coach-only accommodations, and diesel-powered for the distance, was the *Southerner*, trains 47 and 48. Its route was New York-New Orleans via Atlanta and Birmingham, exclusively on Southern system rails. No other through train operated over this exact route, although service was offered over major segments, most notably the New York-Washington-Atlanta-New Orleans triumvirate of the *Crescent*, *Piedmont Limited*, and *Washington-Atlanta-New Orleans Express*. All linked their end-points with through cars but operated via the West Point Route and Louisville & Nashville west of Atlanta.

As a fast, all-coach train, the *Southerner* could test the *El Capitan* theory without disrupting the schedules and patterns of existing Pullman services. Southern regarded the all-Pullman *Crescent* as its premier train and was loath to tinker with it beyond replacing its Ps-4 Pacific steam locomotives with E6A-B diesels around the time of the *Southerner*'s debut in early 1941.

Southern consulted Electro-Motive Corp., a subsidiary of General Motors, to help with the scheduling. After considering curve, grade, and local-ordinance effects on train speed, and calculating the acceleration and deceleration characteristics of the trains, EMC figured the *Southerner* for a Washington-New Orleans run of 23 hours, 49 minutes with a single E6 and seven cars. The fastest D.C.-New Orleans schedule then in effect was the multi-railroad *Crescent* at nearly 28 hours. Southern lengthened the timing to 24 hours flat when it decided to add another coach to the consist between Atlanta and Washington. No problem, right? Well, the Pennsylvania Railroad nearly vetoed the schedule because turnaround time in New York was tight—at least 2½ hours were needed to turn and clean the train at Sunnyside Yard. When the *Southerner* started service on March 31, the schedule gave the yard crews, mechanics, and coach cleaners exactly 2 hours, 47 minutes to do their work . . . assuming the inbound train was on time, that is.

OLD SERVICE, RE-EQUIPPED

If the *Southerner* was conquering new frontiers in markets, scheduling, and equipment utilization, the *Tennessean* (trains 45-46) was designed to milk a ready-made market between Washington and Memphis. Until the

PHOTO, CAROLINE M. MAY, ROBERT MAY COLLECTION, PLACEMAT, SRHA COLLECTION

Northeast of Bristol, on the Tennessee-Virginia state line, the *Tennessean* was steam-powered. In May 1953 (far left), Norfolk & Western J-class 4-8-4 602 wheels train 46 east near Vicker, Va. When the new *Tennessean* was on display in Greeneville, Tenn., on May 11, 1941, Mayor R.M. May of nearby Jonesboro posed in the cab of E6A 2900.

streamliner came along, the best the Southern had to offer in this corridor was the *Memphis Special* on an all-day-and-all-night schedule. The train's main function was hauling mail, so that source of revenue received primary consideration in the schedule. Would streamlined equipment on a modestly faster timing attract more passengers without sacrificing the Post Office Department's requirements? Southern decided to find out.

Southern had all but written off the New York-Memphis market. Pennsy and L&N provided a competitive through service via Cincinnati, so the *Tennessean* made its debut without any New York cars in its consist (the *Memphis Special* had carried New York-Memphis Pullmans). Because the train ran over Norfolk & Western between Lynchburg and Bristol, Va., it made sense to dieselize west of Bristol only. And because Southern's Washington-Lynchburg segment was so short and diesels so expensive, the company decided to leave that leg of the *Tennessean* in the hands of steam.

Famed industrial designer and train buff Otto Kuhler drew plans for a suitably modern shroud for one of the Ps-4 Pacifics. Engine 1380 was selected for the beauty treatment and emerged from Southern's Spencer (N.C.) Shops in sleek sylvan green and aluminum splendor. The 1380, Southern's only streamlined steam locomotive, retained her shrouding for the rest of her active days, even after being bumped from the *Tennessean* after World War II ["Queen of the First Ladies," Fall 2001 CLASSIC TRAINS].

EMC men studied the Bristol-Memphis line for the optimum schedule as they did for 47-48 between Washington-New Orleans. They declared that two E6's and 9 or 10 cars (depending on the specific part of the run) could chop the *Memphis Special*'s 15 hours down to 11 hours, 46 minutes.

But Southern ultimately adopted a schedule a lot closer to that of the old *Special* than to EMC's calculations because of the time needed to work the mail. And although the *Tennessean* was originally envisioned as an all-coach streamliner, there was enough local sleeping-car business to keep a Chattanooga-Memphis heavyweight section car in the consist. Entreaties from the Nashville, Chattanooga & St. Louis also resulted in retaining a Bristol-Chattanooga-Nashville car, which was not originally contemplated.

The New York-Memphis sleeper route was truncated to Bristol-Memphis, at least initially. But a shrill outcry from Pullman regulars, who objected to a seat on the all-coach segment between Bristol and Washington, quickly convinced Southern to extend the Bristol car to Washington. This meant that the *Tennessean* ran as a pure coach streamliner between Bristol and Washington for barely a month after its May 18 debut. The Pullman heavyweights were painted silver, instead of Pullman green, to match the streamlined cars.

Both the *Southerner* and the *Tennessean* began amid much publicity and a pre-inaugural exhibition tour on their routes, stopping in major towns and cities so potential passengers could get a good look at them. The characteristics of their service couldn't have been more different. Although they utilized identical diesel and streamlined equipment, the *Southerner* scorched the ballast on a precedent-setting schedule, besting the premier *Crescent* by three to five hours (depending on direction). The *Tennessean*, on the other hand, was content to approximate the pace of the old *Memphis Special*.

Did new equipment and clean diesel power make that much difference? Did Ernest Norris's study and its fence-straddling conclusions pay off? Yes, yes, and no. By September 1941, the *Tennessean* had more than doubled coach patronage over that of the *Memphis Special*. And the *Southerner*? Its popularity was astonishing—trains 47/48 ran full and made money from the outset. But the success was short-lived and bittersweet. Southern Railway and Ernest Norris would wait nearly a decade before additional lightweight equipment graced system rails, because at the end of 1941, more important world matters got in the way. ■

400 miles in 400 minutes

JOHN PROEBSTING

JOHN PROEBSTING COLLECTION

400 FAMILY: Chicago & North Western's Chicago-Minneapolis flyer, the *400*, began life in 1935 as a heavyweight, steam-powered train that competed with Milwaukee's *Hiawatha* and CB&Q's *Twin Zephyrs*. EMC E3A's (right) arrived in June '39, followed 3½ months later by distinctive Pullman-Standard lightweight cars (far right, near Kenosha, Wis., in 1960). Offspring of the Twin Cities train included the *Minnesota 400*, streamlined in '42 and pulled by old 4-6-2's, one of which is seen at Arlington Heights, Ill., in '56.

AL CHIONE COLLECTION

Hollywood's *Zephyr* ride

Burlington's breakthrough train played the title role in RKO's thriller, "The Silver Streak"

BY **LES HAMMER**

A STREAMLINED TRAIN streaks across the prairie on moonlit rails, bound on a mission of mercy, its glowing headlight piercing the darkness. Inside the cab, a young engineer grips the throttle with one hand while tugging at the whistle cord with the other. The speedometer hovers at a heart-stopping 100 mph. Flanges screech on rails as the speeding train rounds a sharp curve. Tensions rise among the passengers, seated in the observation lounge.

"I can't stand it!" cries a distraught woman, rising from her chair. "I can't, I tell you. We're going too fast. We'll all be killed. My ears are ringing. My head hurts!" Other passengers attempt to calm the terrified woman, who collapses in hysterics. "I can't stand it!" she screams again. "I can't stand it any longer!"

The train was the Burlington *Zephyr*. The time was 1934. The medium was the train's cinematic debut, *The Silver Streak*, produced by RKO Radio Pictures. Critics panned the melodramatic, outrageously plotted movie whose own producer conceded was "very bad railroading." Ignoring the negative reviews, cinema devotees and railfans flocked to theaters in droves, eager for their first glimpse of the diesel-electric train that was billed as "the fastest ingenue" in motion-picture history.

Flash back to early 1934, when Union Pacific introduced the nation's first streamliner, the M-10000, an articulated, three-car train built by Pullman-Standard and powered by an oil-distillate engine. The futuristic train scored a hit with the public and spawned UP's diesel-powered M-10001, which set a North American record of 120 mph in late 1934.

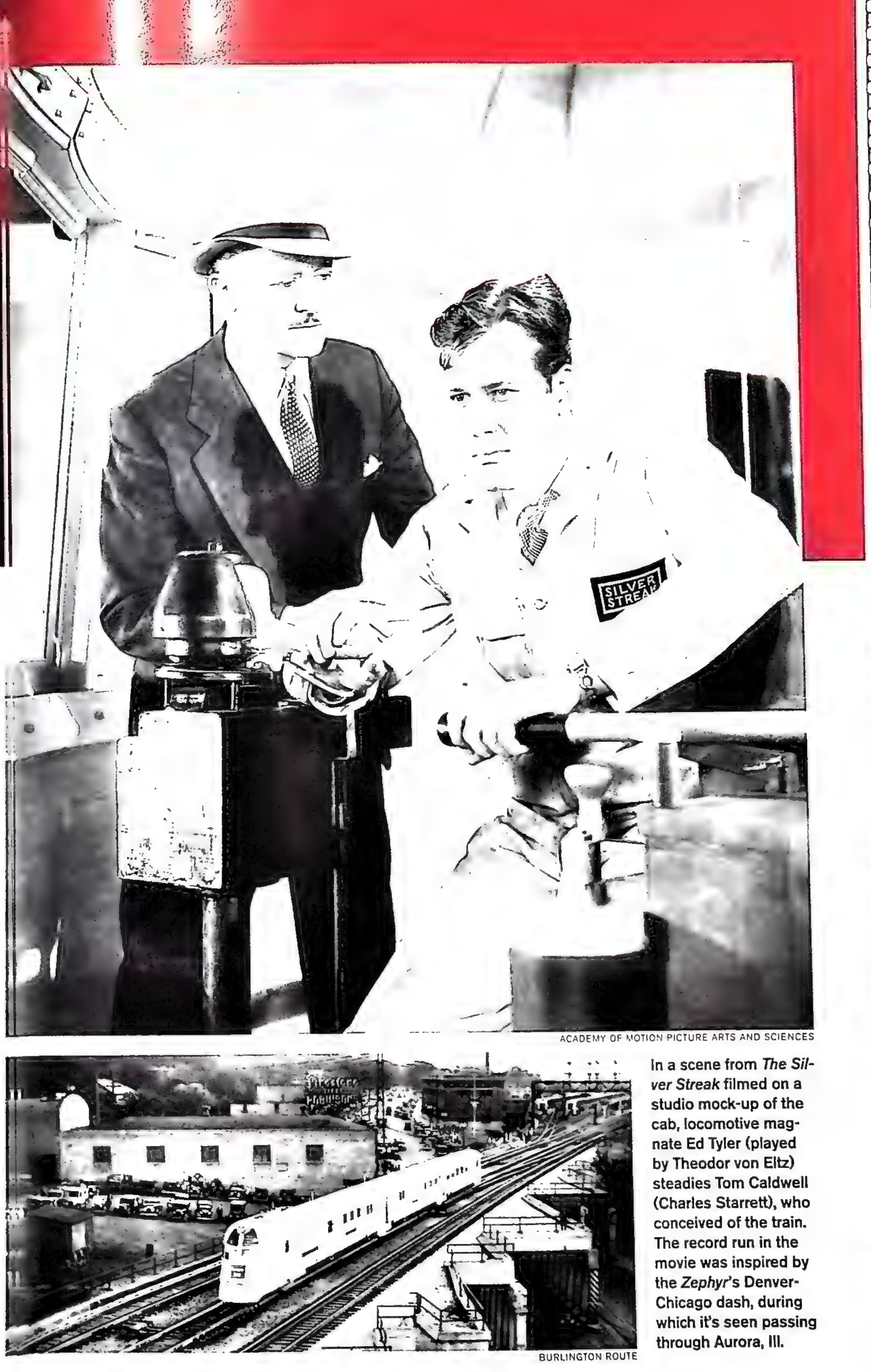
Despite those trains, it was the *Zephyr*—the brainchild of Ralph Budd, Chicago, Burlington & Quincy's visionary president—that captured the popular imagination from the moment it left the Edward G. Budd Manufacturing Co. plant in Philadelphia on April 7, 1934. Built of gleaming stainless steel and powered by a 600 h.p. diesel engine, the train reached a top speed of 104 mph during its first test run.

It followed that with its most famous trip, the publicity dash of May 26, 1934, when it streaked nonstop from Denver to Chicago in a record 13 hours, 5 minutes. For spectators accustomed to the sight of a hulking steam locomotive pulling a dark green consist of heavyweight cars, the *Zephyr* was nothing short of spectacular.

The high-speed marvels were barely out of the shops when Hollywood pounced on the idea of an action drama climaxed by the record run of a streamlined train. But screenwriters struggled to come up with a plausible story, because aviation had advanced to the point where an airplane could transport anyone or nearly anything from coast to coast in 14 hours.

Enter Roger Whately, editor of *Diesel Digest*, who showed up one day at the Gower Street entrance of RKO Pictures in Hollywood. A guard directed him to the office of producer Glendon Allvine. In a scene straight out of *The Last Tycoon*, the brash young editor pitched his idea to the hard-boiled producer, who had read and rejected similar scenarios with easily deflatable plots. Allvine listened intently, intrigued by Whatley's novel premise of a streamlined train carrying something still too unwieldy to be transported by air —an iron lung, the early curative device for polio patients. To Allvine, a former publicity director for film mogul William Fox, Whatley's story line spelled "box office."

While Whately banged out the first draft of his story, tentatively titled



ACADEMY OF MOTION PICTURE ARTS AND SCIENCES

BURLINGTON ROUTE

In a scene from *The Silver Streak* filmed on a studio mock-up of the cab, locomotive magnate Ed Tyler (played by Theodor von Eltz) steadies Tom Caldwell (Charles Starrett), who conceived of the train. The record run in the movie was inspired by the *Zephyr*'s Denver-Chicago dash, during which it's seen passing through Aurora, Ill.

"Hi-Ball Unlimited," Allvine phoned Union Pacific's office in Los Angeles to inquire about the availability of the *M-10000* for filming. He was referred to UP's corporate office in Omaha, but to his dismay, the railroad balked at the idea of loaning its premier train to a movie studio. While waiting for a definitive answer from the UP, Allvine read that the *Zephyr* was in the midst of a Western tour, highlighted by its appearance at ceremonies in Colorado to mark the opening of the Denver & Rio Grande Western's Dotsero Cut-off linking its Royal Gorge Route with the Denver & Salt Lake's Moffat Route. Losing no time, Allvine wired CB&Q's Ralph Budd in Denver.

On June 20, the *Zephyr* reached Los Angeles, where it went on display at Exposition Park. As wide-eyed Angelenos crowded around the train, Burlington and RKO executives held a conference in its observation lounge. The meeting ended with an agreement that the railroad would loan the *Zephyr* to the studio with one proviso: "Do not wreck it."

ACADEMY OF MOTION PICTURE ARTS AND SCIENCES

Actress Sally Blane chats with Burlington Route executive Warren Fuller, who played a railroad director in *The Silver Streak*.

With his streamlined star under contract, Allvine turned his attention to the screenplay. As outlined by Whately, the story began in Philadelphia, where the all-aluminum, diesel-electric "Zoomer" makes an abortive test run, and ended in Los Angeles, where the streamlined train delivers its precious cargo of iron lungs to a stricken city. To his credit, the veteran producer suggested a number of script changes for pictorial and topical interest. Whately agreed, changing the locale of the opening scene to Chicago, site of the 1933-34 Century of Progress exposition, and moving the setting of the closing sequence to the new Boulder (now Hoover) Dam, nearing completion on the Colorado River southeast of Las Vegas, Nev.

Mindful of the fact that Whately had no experience as a screenwriter, Allvine teamed him with a seasoned writer, Jack O'Donnell.

While the pair fleshed out the first draft of the screenplay, Allvine looked for a director capable of juggling the logistical demands of filming on location and shooting on a limited budget. For better or worse, he entrusted the directorial reins to Thomas "Tommy" Atkins, who had been working as an assistant director at RKO since 1927. As a first-time director, Atkins received a paltry salary of $125 a week—a fraction of what most of the cast was paid.

After scouting the location at Boulder Dam, Allvine and his colleagues returned to Hollywood, where they labored over three drafts of the unfinished script. Their work paid off with the revised story of an ambitious mechanical engineer named Tom Caldwell, who pitches his revolutionary design for an aerodynamic train to the financially ailing "CB&D Railroad." To his dismay, the road's conservative board of directors, headed by its reactionary president, Barney Dexter, rejects Caldwell's design as impractical. Disappointed by her father's resistance to new technology, Ruth Dexter —Caldwell's girlfriend—convinces Ed Tyler, owner of the Tyler Locomotive Works, that the basic design is sound. Fortified in his belief, Tyler orders the construction of a prototype, dubbed the *Silver Streak*.

Because of an unforeseen mechanical problem, the streamliner fails its trial run. Unwilling to back its development, Dexter turns the *Silver Streak* into a sideshow attraction at the Chicago World's Fair. Humiliated, Caldwell quarrels with Ruth, who leaves on the next train for California. Meantime, her brother Allan takes an engineering job at Boulder Dam, where he is stricken with polio. After learning that an iron lung cannot be transported by air, Dexter arranges for a shipment of respirators by train. With Caldwell at the throttle, the *Silver Streak* embarks on a 2000-mile run from Chicago to Boulder City. En route, a German spy, who is wanted for murder, attempts to sabotage the speeding train, only to be overpowered by the young engineer. In the final reel, the *Silver Streak* reaches its destination, where Tom Caldwell is reunited with his newfound love.

With a production budget of $122,000—one-fourth of that for the 1930 railroad drama *Danger Lights* ["Thrills and Chills on the Milwaukee Road," Fall 2001 CLASSIC TRAINS]—Allvine could not afford one bankable star. "If I had been spending my own money," he admitted, "I think I would have spent ten thousand dollars more to buy one well-known actor's name for the exhibitor to put in lights on his marquee." For the part of Tom Caldwell, the producer originally wanted popular leading man Joel McCrea, but settled for the handsome, rugged actor Charles Starrett, who was soon to make a name for himself as the black-clad, gun-toting Durango Kid. For the role of Ruth Dexter, Allvine cast the beautiful actress Sally Blane, who co-starred in the 1932 railroad thriller *Phantom Express* but whose film career was overshadowed by that of her famous sister, Loretta Young.

Though lacking in star power, the cast included some of Hollywood's best-known character actors. Silent-film star William Farnum played CB&D President Barney Dexter. Actor-

ACADEMY OF MOTION PICTURE ARTS AND SCIENCES

German spy Erdmann Bronte (played by Irving Pichel) overpowers Tom Caldwell (Charles Starrett) and pilot (Edgar Kennedy) in a scene filmed on a studio mock-up of the *Zephyr*'s engineroom that included a detailed replica of a Winton 201A diesel.

director Irving Pichel, best known as the sinister manservant in *Dracula's Daughter* and the sonorous narrator of *How Green Was My Valley*, portrayed the murderous spy Erdmann Bronte. Arthur Lake, fondly remembered as the high-pitched Dagwood Bumstead in the popular series *Blondie*, teamed with Guinn "Big Boy" Williams to play the garrulous mechanic Crawford and his long-suffering sidekick Higgins. Rounding out the cast were actor-writer Hardie Albright as the ill-fated mechanical engineer Allan Dexter; former Keystone Kop Edgar Kennedy as the bumbling pilot Dan O'Brien; and, notably, Theodor von Eltz, who starred in the silent railroad epic *The Great Mail Robbery*, as locomotive magnate Ed Tyler.

One Burlington Route executive, Warren Fuller, assistant to the vice president of operations, landed a bit part as a railroad director. But the most technically demanding role went to CB&Q engineer Jack Ford, who was required to be at the throttle whenever the *Zephyr* was in motion. Unfortunately, Ford (who reportedly had no trouble making the train "hit its marks") does not appear on screen—all of his scenes, either as actor or double, wound up on the cutting-room floor.

Prior to filming, the CB&Q removed the rectangular "Burlington Route" emblem from the train's nose and replaced it with a "Silver Streak" logo. In Hollywood parlance, the *Zephyr* was ready for its close-up.

On the morning of September 5, 1934, the RKO Pictures film crew, led by cinematographer J. Roy Hunt, arrived in Chicago to begin what would be two weather-plagued days of shooting RKO 788—*The Silver Streak*—at the Century of Progress fair. By accident or design, the real Burlington Route received free publicity when one shot, taken at the fair, wound up in the final print.

"[The producers] did their best to eliminate references to the Burlington," says Hol Wagner, editor of the *Burlington Bulletin* magazine of the railroad's historical society, "but there is a shot of the Burlington Route herald on a sign above the train."

On September 7, the film company (sans actors) boarded the *Zephyr*, still "in costume," for the 160-mile journey to Galesburg, Ill., a major Burlington terminal. En route, Tommy Atkins and his cameraman filmed parts of the trial run, where a freight train, pulled by CB&Q Mikado 4999, overtakes the *Silver Streak*. In Galesburg, the movie crew shot portions of the record run, where the train dashes under a coaling tower in the engine terminal.

"I am afraid we ruined a lot of good railroad men in Galesburg during the two days we ran the *Zephyr* back and forth through the yards," conceded Glendon Allvine, "as our cameras recorded action violating all the safety-first regulations they had learned in a lifetime."

On September 10, the company packed up its equipment and moved

EDDIE BRANDT'S SATURDAY MATINEE

Allan Dexter (portrayed by Hardie Albright) and his sister, Ruth (Sally Blane), greet Tom Caldwell (Charles Starrett) leaning from the cab of the *Silver Streak*.

45 miles west to Burlington, Iowa. On a scenic stretch of track, the crew filmed one of the most hair-raising—and improbable—scenes in the record-run sequence, where the *Silver Streak* races toward an open drawbridge over the Mississippi River. For dramatic impact, special-effects director Vernon Walker took the developed footage and ran it through an optical printer. By the reprinting of every other frame to speed up the action, the swing span appears to close just as the train reaches the bridge. For impressionable movie fans, the cinematic sleight-of-hand worked.

"What they don't show," notes Wagner, "is that the sharpest curve on the Burlington main line is just west of the bridge. Normally, nothing goes faster than 20 mph there. Low center of gravity or not, you cannot take that curve at 100 mph."

Following a stop to inspect and service the train at CB&Q's West Burlington Shops on September 12, the RKO company boarded the *Zephyr* for a journey over the Burlington main line to Colorado. On the Denver & Salt Lake, bad weather and mainline trains caused delays. When the skies cleared, the crew resumed the trip to the majestic Royal Gorge, shooting background footage all the way. To his consternation, Roy Hunt discovered that there were few places to mount a camera on a streamlined train, on which the doors were flush and the windows were sealed. By his account, he risked his life to take traveling shots from the pilot of the speeding train.

"One of the most dangerous yet most thrilling of all the sequences filmed," Hunt wrote, "was when this writer was precariously perched on a mount fastened firmly to the bulbous prow of the train. The nose of the train cut the wind to either side and swayed the operator with it, as though undecided in which direction the body should be precipitated. Those were breath-taking moments in the proper sense of the word."

September 17 saw the film crew and train at Boulder Dam. (Ironically, from Salt Lake City to Boulder Dam and on to Los Angeles, the *Zephyr* had to use the rails of Union Pacific, which had refused RKO permission to use its own train.) With permission from the U.S. Bureau of Reclamation and the Six Companies construction firm, Tommy Atkins filmed scenes at Lookout Point with Hardie Albright and Sally Blane—the first principal actors to be called since the start of production.

The movie company returned to Hollywood on September 20. There the cast and crew spent a week shuttling between the RKO studios and area location sites. On the morning of the 25th, the director shot the climax of the record-run sequence at the Southern Pacific depot in Canoga Park (standing in for Boulder City). When the cast and crew broke for lunch, engineer Jack Ford climbed back into the cab of the *Zephyr* for a short ride to the RKO ranch in Encino. On arrival, the train rolled to a stop at the end of a spur line, where studio carpenters had recreated the *Zephyr* exhibit at the world's fair, using strategically placed props and signs.

Two days later, Tommy Atkins filmed the beginning of the trial-run sequence at the SP depot in Chatsworth (standing in for a Midwestern station). Satisfied that filming was going well, Allvine dashed off a letter to H. F. McLaury, public-relations director for the Burlington Route.

"Photography is progressing nicely, and I think we are going to have a fine picture," he wrote. "We hope to finish next Wednesday, October 3rd, and about a week later I will know better just how the scenes fit together."

From the outset of production, Burlington and RKO officials agreed that interior scenes could not be filmed on the *Zephyr*, owing to the confined spaces. For the challenging task of recreating the train's interior, supervising art director Van Nest Polglase turned to his talented protege, Perry Ferguson (who would create the groundbreaking production design for *Citizen Kane* in 1941). Working from blueprints, photos, and sketches, Ferguson and his team of set designers built a mock-up of the cab, engine-room, and observation lounge on a process stage, complete with rear projection screen. To a casual observer, the meticulously designed set (including a replica of the Winton 201A diesel engine) appeared to have been lifted from the *Zephyr* itself.

Says CB&Q historian Hol Wagner, "[On the set] there is no wall between the cab and the engine room; otherwise, it looks reasonably accurate."

On September 29, the cast and crew reported to Stage 10 to begin filming the on-train scenes. For seven days, the actors worked under the

BURLINGTON ROUTE

The *Zephyr* was a big attraction at CB&Q's Century of Progress exhibit in Chicago (above). RKO shot scenes for *The Silver Streak* there, and at a facsimile it created in California (right), where actor Charles Starrett, in his role of Tom Caldwell, is seen crouching in the cab doorway.

RKO RADIO PICTURES

blazing lights of the sweltering soundstage, where the director shot the fight between Bronte and Caldwell. The film was nine days behind schedule when the production wrapped on October 9 with pickup shots of Sally Blane in a mock-up of a Pullman car.

Even before the camera stopped rolling, film editor Fred Knudtson faced a monumental task of editing more than 200,000 feet of film. In the process of assembling a rough cut, he discovered that one scene filmed in Colorado had been mutilated in the cutting room. Special-effects wizard Vernon Walker rode to the rescue, reshooting the sequence using a miniature set complete with track and an 8-foot-long model of the *Zephyr*, courtesy of the CB&Q.

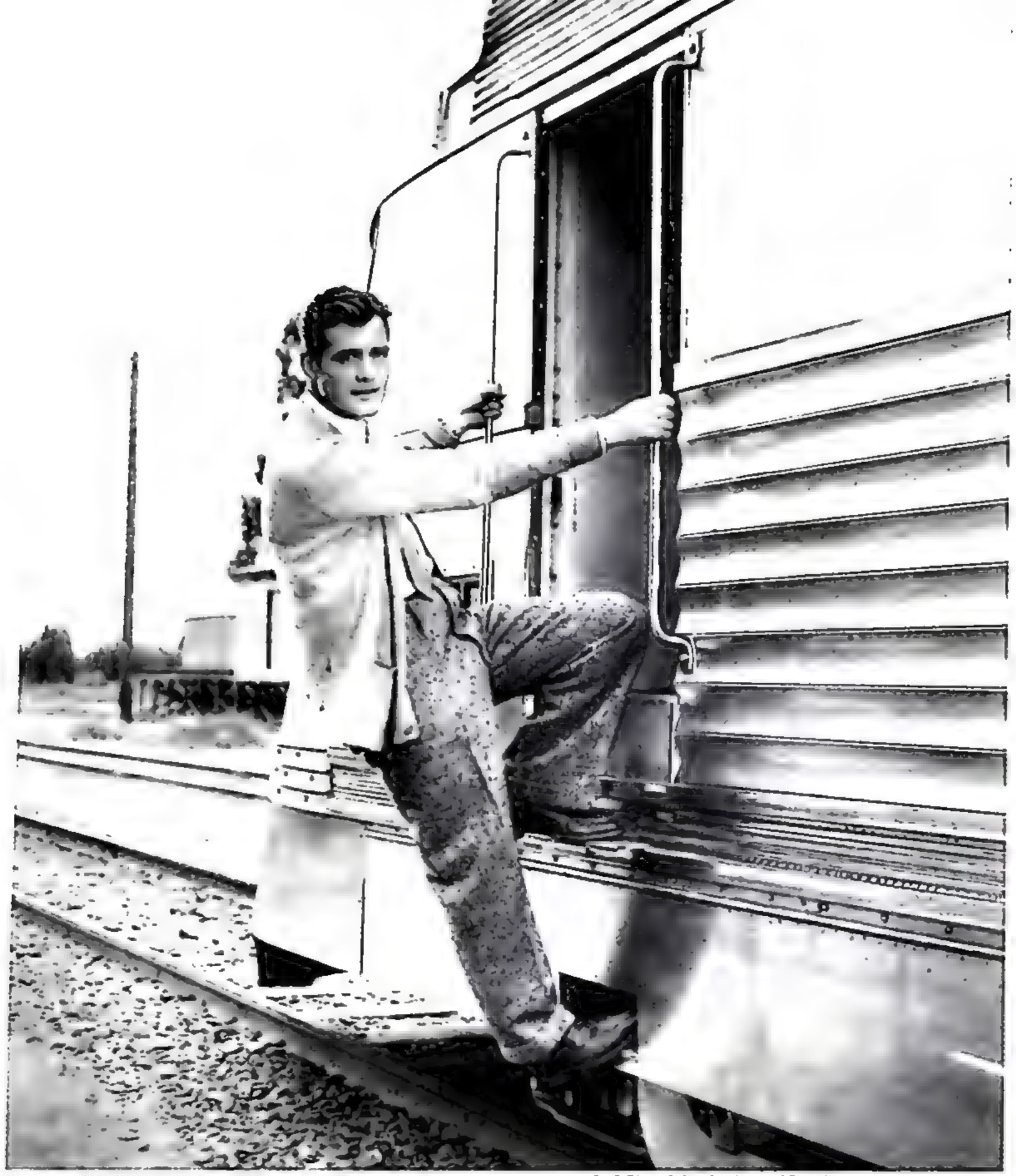
Confident that *The Silver Streak* was going to be a hit, Allvine fired off a letter to Ralph Budd. "The sound and music work being done on the picture will probably be completed so that we can show it with an audience about November 7th," he wrote. "Mr. Atkins and I have screened it in its rough cut version so many times that I am afraid we have lost all perspective on it and we will need an audience to give us a sense of values."

Applause and cheers greeted the *Zephyr* when it made its screen bow at a sneak preview on November 7, 1934, at the RKO Hillstreet Theatre in Los Angeles. By one account, the train upstaged Fred Astaire and Ginger Rogers, the stars of the first feature.

"[The audience] forgot about *The Gay Divorcee*," gushed Hollywood press agent Clarence Upson Young. "For seventy-two minutes they rode on the rails. One gasp followed another as they literally held onto their seats. The house rocked with excitement"—while jaded reporters shifted in their seats and yawned.

"The first half of the picture drags like a slow freight on the Erie," complained the critic for *The Hollywood Reporter*. "Irving Pichel was the sacrificial victim with the worst-written heavy role since the days of *The Curse of Drink*. The direction looks as if Tommy Atkins was cutting his directorial teeth."

Fortunately, *The Silver Streak* sur-



ACADEMY OF MOTION PICTURE ARTS AND SCIENCES

Mechanical engineer Tom Caldwell (played by Charles Starrett) climbs into the cab of his brainchild, the *Silver Streak*, for a trial run of the radical new train.

vived the critically panned preview and the oddly unpublicized "world premiere" on December 10, 1934, in Galesburg. "[The film] was shown at the West Theatre, which was a very low-class theater," says Patty Mosher, archivist for the Galesburg Public Library. "I think that if the stars were coming [to the premiere] they would have shown it at the Orpheum. There was just nothing about it, except the theater advertisements. I truly doubt that there was much fanfare about it."

The Silver Streak opened on January 15, 1935, at the RKO Mayfair Theatre in New York. Prior to the screening, Jack Ford paid a heartfelt and moving tribute to the real star of the film—the *Zephyr*.

"She has been from coast to coast and has asked no quarters from the Seaboard to the steepest grades in the Rockies," said the veteran engineer, standing before a microphone. "She has gone everywhere, calm and sure of herself, proudly pushing ahead like our old pioneers. Of course, I didn't know that they were taking her into Hollywood to be slicked up for the movies. But she stood the night life and the make-up better than I did."

Unmoved, film critics scoffed at the lackluster cast, clumsy direction, and ridiculous plot. "Turning a switch with just a split-second to spare is thrilling the first time," noted the reviewer for *Variety*. "But the *Silver Streak* misses derailing at not less than half a dozen switches. Just what bona fide railroad men may think of the incredible feats of sustained speed and hairpin curves taken at 120 miles an hour can only be guessed at."

Producer Glendon Allvine got the last word when *The Silver Streak* earned $107,000 in profits, making it one of the most successful pictures released by the deficit-ridden studio in 1934-35. With P. T. Barnum-like flair, he orchestrated a mass merchandising and promotional tie-in campaign that pre-dated *Star Wars* by four decades. Advertisements for Camel cigarettes (featuring Jack Ford) suggested the romance and thrills (of smoking) on the *Silver Streak*. Retail stores sold Silver Streak carpet sweepers, razor blades, and roller skates. One wholesaler, Grennan Bakeries of Chicago, supplied 60,000 customers with Silver Streak cookies. On the literary side, Whitman Publishing Co. printed a "Big Little Book" movie edition for children, while Haskell-Travers published an illustrated edition of the screenplay, supplemented with essays by RKO cast and crew members.

For his part, H. F. McLaury purchased 200 sets of the *Zephyr* model train, produced by American Flyer, for use as lobby displays (though it is not known how many of them actually wound up in movie theaters).

After its initial release, *The Silver Streak* languished in film vaults until 1955, when the RKO film library was sold to television. At regular intervals, the railroad drama surfaced on late-night TV. In recent years, it turned up on video and DVD. Unlike the archival print of *Danger Lights* (restored by Turner Entertainment in 2001), the acetate print of *The Silver Streak*, made from the original camera negative, remained in good condition.

"At this time, there are no plans for either restoration or preservation of this title," said John Cassidy, senior film timer for Film Technology Co. in Hollywood. "This is not bad news. It just means that the elements in the vaults are in good shape. Elements are routinely inspected for any sign of vinegar syndrome or deterioration, as was the case with *Danger Lights*."

Today, visitors to the Museum of Science & Industry in Chicago marvel at the restored original *Zephyr*. Now and then, a spry octogenarian who has made a pilgrimage to the subterranean temple gazes at the legendary streamliner, named for the God of the West Wind, and recalls a glimpse from the window, a view from trackside, or a ride on the train. "She sure is coming —wasn't she?" In the mind's eye, the scene dissolves to a neon-lighted movie palace, where Jack Ford invites the audience to come along for the ride.

"Like those real movie stars who were with me," Ford says, "you are going to get the ride of your life when you see her true to her name, graceful and beautiful, a shimmering streak cleaving the winds of Zephyrus." ■

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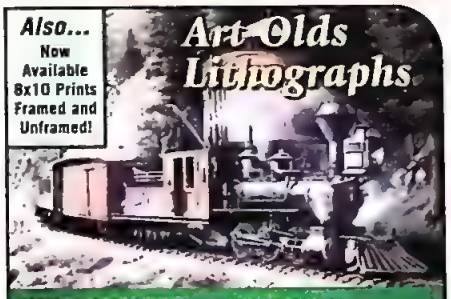

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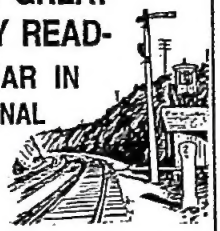

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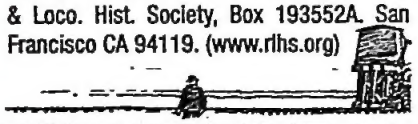

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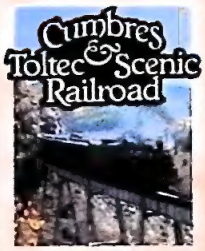

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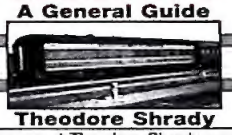

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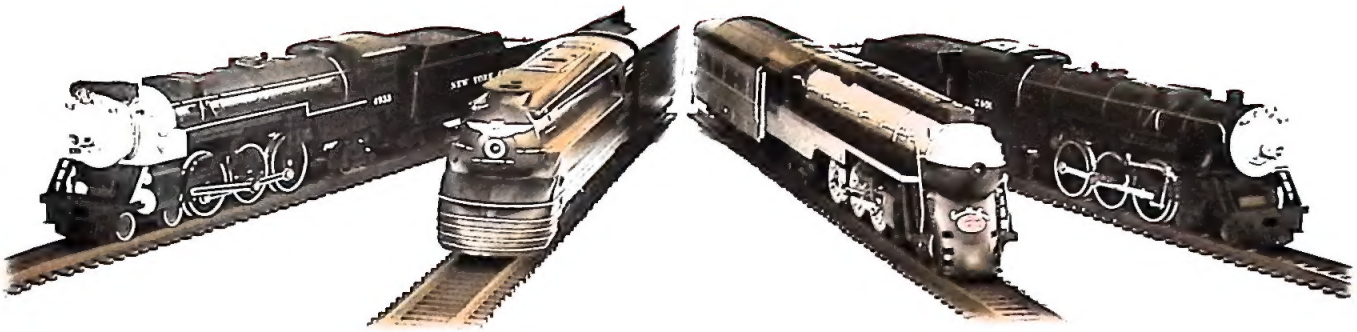
S Scale Streamline Steam & Diesel



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